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# COMMERCIAL FISHERIES REVIEW



VOL. 27, NO. 7

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*Fish and Wildlife Service*  
**Bureau of Commercial Fisheries**  
*Washington, D.C.*







# COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries  
prepared in the BUREAU OF COMMERCIAL FISHERIES.

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## THE U. S. COD FISHERY IN THE NORTHWEST ATLANTIC

By Albert C. Jensen\* and Harriett E. Murray\*\*

### ABSTRACT

The U. S. cod fishery in the Northwest Atlantic has changed greatly during the past 300 years. Originally an inshore fishery with hand lines fished from small boats, it soon moved offshore to the distant banks including the Grand Bank off Newfoundland. Toward the end of the 19th Century, an average of 94 million pounds of cod were landed annually. Most of the catch was salted and dried.

The offshore operations were made more efficient with changes in gear and vessels. The changes also made possible the exploitation of new fishing grounds in inshore waters as well as offshore.

Improvements in handling the catch at sea and ashore and in processing it for market eliminated the salt-cod fishery. The same improvements--filleting and freezing--made other species more popular with consumers and decreased the demand for cod. In recent years, annual U. S. cod landings have been about 35 to 40 million pounds.

Historical and modern details and statistics of the U. S. cod fishery are described. The methods, equipment, and landings are detailed for the New England, Middle Atlantic, and Chesapeake Bay states.

### INTRODUCTION

The history of the U. S. fishery for cod (*Gadus morhua*--fig. 1) is intimately associated with the history of our Nation. From earliest times, cod fishing was important as a source of food and later as a source of the dried-salted product that figured in world trade.

The magnitude of the fishery fluctuated greatly over the centuries but generally it has declined, especially during the past 50 years, as other species became more important to the industry. Cod, however, is still sought by U. S. fishermen and maintains a relatively modest but secure position in the annual landings of food fish. In recent times, when haddock abundance has been low, fishermen landed more cod to supply the market demand for fish.

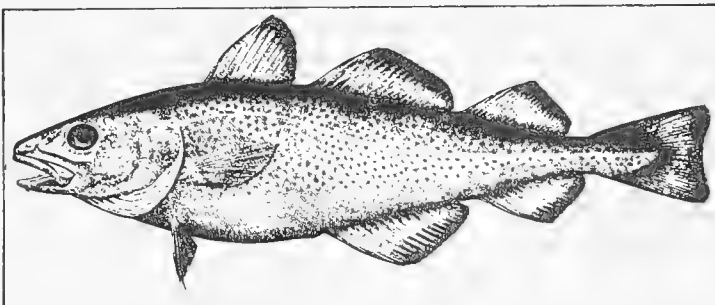


Fig. 1 - Cod (*Gadus morhua*).

### HISTORY OF THE FISHERY

Exploitation of the Northwest Atlantic cod resource began in the 16th Century when French and Portuguese vessels fished the Grand Bank off Newfoundland (Taylor 1957). By the early 17th Century, the New England colonists were fishing for cod in the local waters. In 1624, "no less than fifty ships" from Gloucester fished with hand lines in the offing of Maine and Massa-

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chusetts (Babson 1860). By 1708, New England vessels fished the Nova Scotian banks (Innis 1954) and in 1748 the first cod trip from Georges Bank was landed (Goode 1887).

The vessels, however, began to go farther and farther offshore to fish. In 1757, Gloucester vessels ventured to the Grand Bank. Evidently the fishing there was more productive than on the local banks because by 1788 as many as 60 Gloucester vessels were fishing on Grand Bank (Babson 1860).

Without doubt, cod abundance was low in the local waters. It does not seem reasonable that the fishermen would risk a long trip offshore in their tiny vessels if there had been plenty of cod nearby. Some attributed the scarcity of fish to power dams built for textile mills (Baird 1874). The dams, it was said, prevented the runs of alewives (*Alosa pseudoharengus*) on which the cod fed. When alewife abundance declined, cod abundance also declined. Other factors no doubt contributed to the fluctuations in abundance.

Table 1 - Annual Landings of Cod from New England Waters, 1893-1962

Year	Landings 1,000 Lbs.	Year	Landings 1,000 Lbs.	Year	Landings 1,000 Lbs.
1893	32,713	1939	50,602	1916	35,399
1894	32,442	1938	59,575	1915	34,782
1895	28,117	1937	72,937	1914	61,840
1896	30,557	1936	56,550	1913	45,414
1897	29,857	1935	56,640	1912	52,687
1898	24,177	1934	50,682	1911	49,797
1899	24,320	1933	59,101	1910	65,567
1900	22,885	1932	56,897	1909	74,755
1901	22,481	1931	61,226	1908	76,121
1902	20,624	1930	75,924	1907	106,494
1903	25,555	1929	67,981	1906	116,250
1904	35,639	1928	63,808	1905	68,430
1905	37,559	1927	72,240	1904	57,276
1906	45,389	1926	75,565	1903	73,872
1907	46,102	1925	64,669	1902	79,060
1908	43,157	1924	61,501	1901	85,243
1909	55,323	1923	57,468	1900	64,064
1910	52,863	1922	58,125	1899	90,993
1911	51,695	1921	60,381	1898	83,193
1912	49,105	1920	51,257	1897	86,543
1913	45,935	1919	56,441	1896	90,449
1914	57,993	1918	56,151	1895	117,005
1915	44,543	1917	40,193	1894	105,363
				1893	89,363

Notes: Drawn or gutted fresh weight.

The success of the cod fisheries varied greatly over the years. Whereas 60 Gloucester vessels fished offshore in 1788, only 8 vessels were fishing offshore 12 years later. By 1819, the fisheries were so depressed that Congress passed a "bounty act" (Earll 1880), a form of subsidy, that put new life in the industry.

Toward the close of the 19th Century, bank fishing, mostly on Georges and Browns Banks, was a flourishing industry with 174 dory schooners taking part. In 1879, the equivalent of 92 million pounds of round fresh cod was landed by the "salt bankers" (Earll 1880). In 1880, a record was set when 294 million pounds of cod were landed (Sette 1928).

No accurate statistics are available for cod landings prior to 1893, but from that date

to the present the data are reliable (table 1). Appropriate conversion factors have been used to change landings of dried-salt fish, green-salt fish, frozen fish, . . . to a standard of gutted fresh fish, the state in which cod is landed in the modern fishery.

The changes in cod landings during the period (fig. 2) generally follow the fluctuations in the entire New England fishing industry. The rapid increase of landings in 1905-06 probably reflects the introduction of the otter trawl which replaced the less efficient line trawl (Jensen and Brigham 1963) and hand lines (fig. 3). From 1914 to 1927, fishing for all species was low and this reduced pressure is reflected in the lower cod landings. During the 1930's, fishing activity experienced a rapid series of ups and downs, caused by several inter-related factors, including a scarcity of fish on the grounds and a tie-up of vessels because of the general economic depression then affecting most American industries.

Landings were reduced in the 1940's because the World War II submarine menace

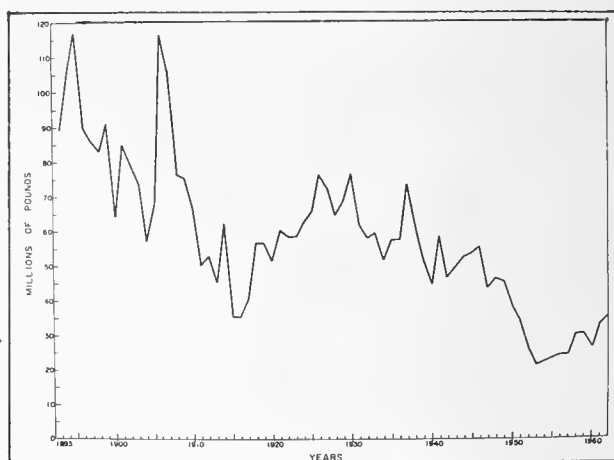


Fig. 2 - Annual New England landings of cod (gutted weight) from New England waters during the period 1893-1962.



Fig. 3 - Hand-lining for cod on Grand Bank in the 1880's (from Goode 1887).

kept many vessels from fishing the offshore banks. In the early 1950's, cod landings again declined when vessels landed more of the abundant--and slightly more valuable--haddock. In the late 1950's, however, cod landings rose when haddock abundance declined drastically. Cod landings during the past 10 years have generally been rising (fig. 4). Of the leading New England groundfish species, cod alone has been landed in ever-increasing quantities during the past decade. Current annual levels have not reached prewar highs, but the trend has been a slow, steady climb--an average increase of more than one-half million pounds per year.

Most of the cod caught by U. S. vessels are landed at New England ports. In 1962 the landings amounted to 35 million pounds. Cod are also caught in a winter fishery, off the Middle Atlantic States where landings are on the order of 3 million pounds and the Chesapeake States where recent landings have been about 750,000 pounds. Those fisheries are described in later sections.

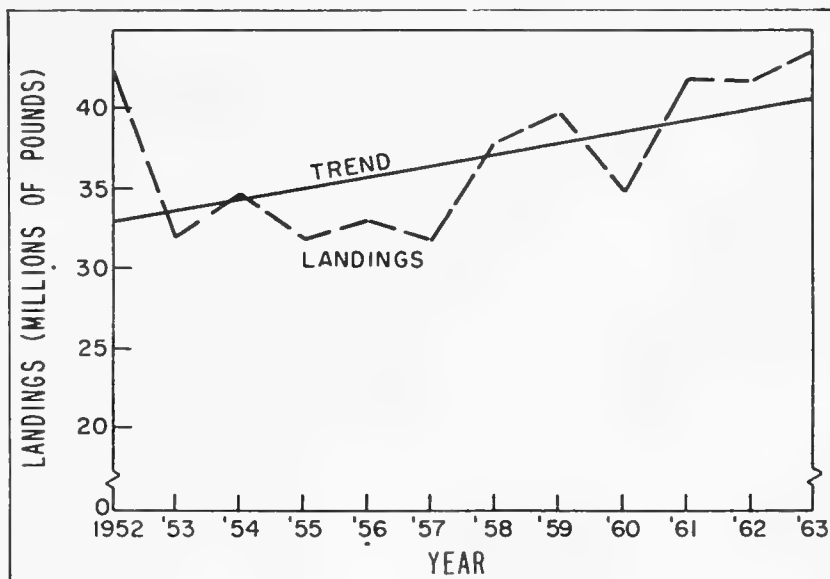


Fig. 4 - Trend in cod landings, 1952-1963 (millions of pounds, round weight).



## BIOLOGY AND DISTRIBUTION OF COD

There are two main reasons why cod are so important as a food fish and thus the object of intensive fisheries. They are extremely abundant on many coastal banks in the North Atlantic, and they grow to relatively large size.

Cod abundance is greatest in the Gulf of St. Lawrence, off Newfoundland. In the spring, an otter trawler may take as much as 35 tons of cod per 2-hour tow (Clark and McCracken 1958). The Georges Bank cod fishery is less productive than the Gulf of St. Lawrence fishery; Boston vessels catch cod at an average rate of about 1.5 tons a day.

Cod often grow to large sizes. A cod caught on a line trawl off the coast of northern Massachusetts in 1895 weighed 211.5 pounds and was over 6 feet long (Jordan and Evermann 1905). In the commercial fishery today, many thousands of cod 30 to 40 inches long and weighing 10 to 25 pounds each are caught each year.

Bigelow and Schroeder (1953) reviewed the present state of knowledge of cod biology. Cod spawn in the winter; the peak of spawning is in December. The females are prolific egg producers and may shed 3 to 9 million eggs each, depending on the size of the fish. Only 1 or 2 of the millions of eggs become adult fish.

The adults feed mostly on shell animals (clams, mussels, crabs), squid, and small fish.

Cod range on both sides of the Atlantic Ocean, from the northern Barents Sea to the Bay of Biscay, around Iceland and the southern half of Greenland. They are found along the North American coast from the southern tip of Baffin Island to North Carolina.

Although they are considered groundfish, cod occasionally rise off the bottom, presumably in search of food. Cod have been caught in as little as 1 fathom of water and as deep as 250 fathoms.

## REGIONAL FISHERIES

The U. S. Bureau of Commercial Fisheries collects and publishes monthly and yearly summaries of U. S. fishery landings by regions<sup>1/</sup>.

In this paper, statistics collected for the Chesapeake Bay, Middle Atlantic, and New England regions are examined and discussed. The data given in tables 1, 2, and 3 come from various sections of the statistical reports and from a review by Sette (1928).

**CHESAPEAKE BAY STATES:** The southernmost commercial fishery for cod is in the Chesapeake Bay region (fig. 5), although during the winter of 1930-31 some cod were caught just south of Cape Hatteras, N. C. (Pearson 1932).

The fishery is seasonal and the annual landings fluctuate greatly. Few cod are caught within Chesapeake Bay. Hildebrand and Schroeder (1928) stated, "The cod is too rare in Chesapeake Bay to be of economic impor-

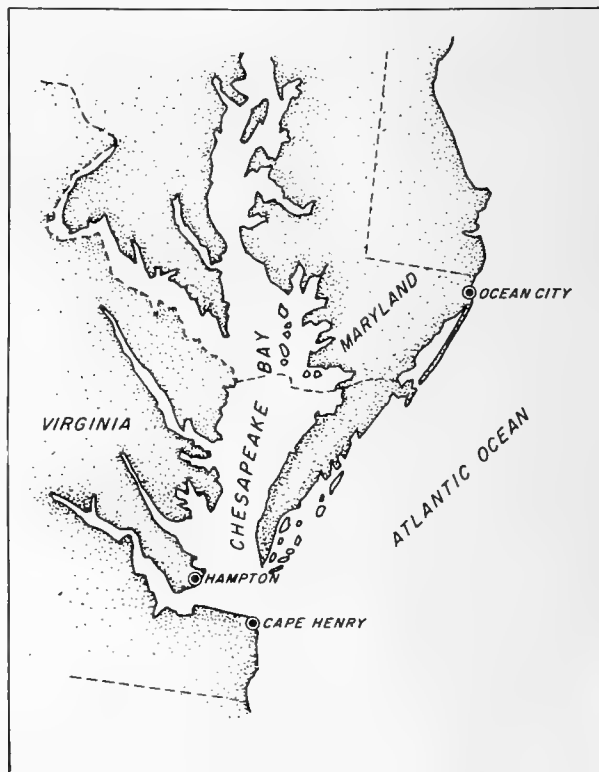


Fig. 5 - Chesapeake Bay states.

<sup>1/</sup>Fishery Industries of the United States, 1932-1938, U. S. Department of Commerce, Bureau of Fisheries; and, Statistical Digests No. 1-54, Fishery Statistics of the United States, 1939-1963, U. S. Department of the Interior, Fish and Wildlife Service. See also, appendices to the Annual Reports to the Commissioner of Fisheries.

tance, as apparently only occasionally a straggler passes between the (Virginia) capes." They noted that in some years, a few cod were taken in pound nets between Cape Henry, Virginia, and Ocean View, Del., in March.

Records from 1897 through 1962 show that the landings fluctuated from year to year but generally have increased. In 1897, 1,000 pounds of cod were landed; in 1962, 414,000 pounds. Pound nets formerly were the principal gear, but other trawls and line trawls (called trot lines in the region) have taken more cod in recent years (table 2).

Table 2 - Annual Landings of Cod, Chesapeake Bay States, by Gear, 1897 - 1962													
Year	MARYLAND					VIRGINIA					Grand Total		
	Otter Trawl	Hand Lines	Lines Long or Set with Hooks	Other	Total	Otter Trawl	Hand Lines	Lines Long or Set with Hooks	Other	Total			
(1,000 Lbs.)													
1962	No breakdown by gear available					375	No breakdown by gear available					39	414
1961	125	1	663	-	789	1/	-	30	-	30	819		
1960	354	1	190	-	545	6	1/	2	1/	8	553		
1959	383	-	-	-	383	72	-	28	-	100	483		
1958	52	-	-	-	52	15	-	50	-	65	117		
1957	3	-	-	-	3	-	-	-	-	-	3		
1956	1	-	-	-	1	1/	-	-	-	1/	1		
1955	23	-	-	-	23	-	-	-	-	-	23		
1954	6	-	-	-	6	2	-	-	-	2	8		
1953	-	-	-	-	-	1	-	-	-	1	1		
1952	1/	-	-	-	1/	2	-	-	-	2	2		
1951	1	-	-	-	1	2	-	-	-	2	3		
1950	3	-	-	-	3	3	-	-	-	3	6		
1949	1	-	33	-	34	3	-	-	-	3	37		
1948	57	-	-	-	57	10	1	-	-	11	68		
1947	1	-	20	-	21	14	-	-	-	14	35		
1946	17	-	72	-	89	15	-	-	1/	15	104		
1945	23	-	92	-	115	3	-	-	-	3	118		
1944	8	-	34	-	42	7	1	-	-	8	50		
1943	No statistics available					No statistics available					-		
1942	1/	-	-	-	1/	-	-	-	-	-	1/		
1941	No breakdown by gear available					1	No breakdown by gear available					1/	
1940	2	-	-	-	2	5	-	-	-	5	7		
1939	-	-	-	-	-	4	-	-	-	4	4		
1938	-	-	-	-	-	1/	-	-	-	1/	1/		
1937	-	-	48	-	48	1	-	-	-	1	49		
1936	-	-	-	-	-	1/	-	-	4	4	4		
1935	-	-	-	-	-	1/	-	-	-	1/	1/		
1934	-	-	-	-	-	1/	-	-	1	1	1		
1933	-	-	-	1/	1/	1/	-	-	6	6	6		
1932	-	-	-	-	-	11	-	-	11	22	22		
1931	-	-	-	-	-	1	-	-	40	41	41		
1930	-	-	-	-	-	1/	-	-	50	50	50		
1929	-	-	-	-	-	-	-	-	56	56	56		
1928	No statistical surveys made					No statistical surveys made					-		
1927	No statistical surveys made					No statistical surveys made					-		
1926	No statistical surveys made					No statistical surveys made					-		
19252/	-	-	-	-	-	-	-	-	17	17	17		

1/Less than 500 pounds.  
2/No statistics available prior to 1925.  
Note: Drawn or gutted fresh weight.

1/Less than 500 pounds.

2/No statistics available prior to 1925.

Note: Drawn or gutted fresh weight.

The Maryland trot-line fishery, centered at Ocean City, became increasingly important in the late 1950's. The winter otter trawl landings were reduced when abundance of the principal species, fluke (*Paralichthys dentatus*) and sea bass (*Centropristes striatus*), declined. In the autumn of 1959, the trawlers shifted to other grounds to fish for cod. Cod had always been present in the area during the winter, but little effort was made to fish for them.

William E. Brey (1963, personal communication) reported, "Trot lines are used because they catch more fish than trawlers. With the trawlers the cod are only taken incidental to the catch of other species.

"The trawlers land cod in late November and December, incidental to the taking of fluke and sea bass and some scup (*Stenotomus chrysops*). The trot lines are fished starting about January 1 to avoid dogfish (*Squalus acanthias*) that are present on the grounds until about the last week in December."

The otter trawls fish the shoals off Ocean City in 30 to 40 feet of water; the trot lines are fished about 10 to 20 miles east of Ocean City at depths of 90 to 120 feet. In 1961, the 24 vessels engaged in the fishery landed a record 789,000 pounds of cod at Ocean City (Power 1963). Some details of the Maryland trot-line fishery are described by Hansen (1964).

**MIDDLE ATLANTIC STATES:** The cod fishery off Delaware, New Jersey, and New York (fig. 6) is also seasonal and takes place largely in the winter. The largest landings are made from November through April and the peak is in December through February. New Jersey is the leading state.

The landings for the period 1897 through 1962 exhibit no clear-cut trend except that perhaps they have declined slightly (table 3). Landings increased from about 6 million pounds in 1897, to a high of 11 million pounds in 1930, and then declined to 4 million pounds in 1961.

Pound nets formerly took large quantities but today few pound nets are fished. Line trawls have been consistently important in the New Jersey fishery but were replaced by otter trawls in the New York fishery. Purse seines and bass pots take small quantities of cod. (See Dumont and Sundstrom 1961 for descriptions of the various kinds of fishing gear.)

June and Reintjes (1957) reported that for the period 1946 through 1953, cod made up 0.7 percent of the inshore otter-trawl catch but

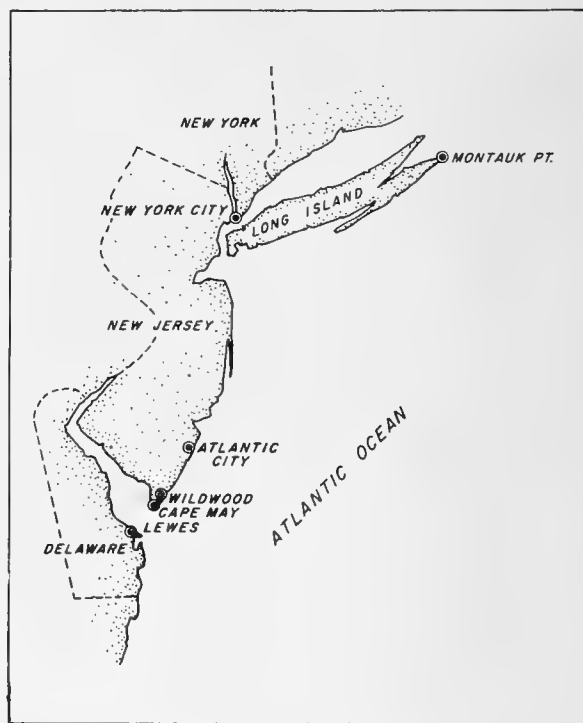


Fig. 6 - Middle Atlantic states.

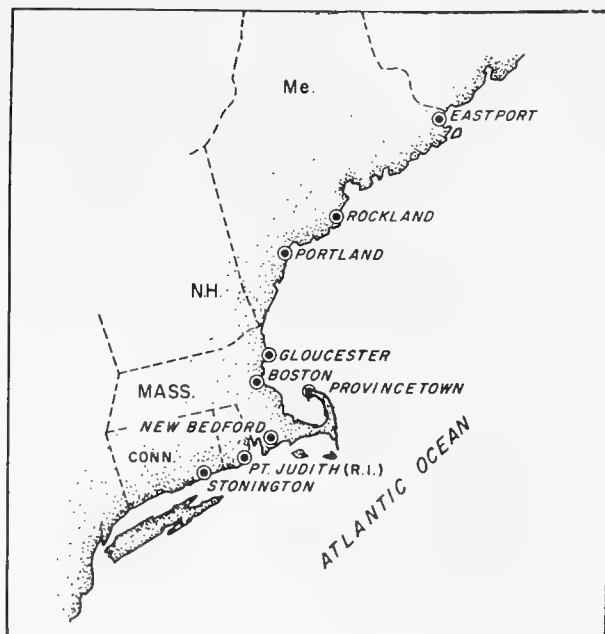


Fig. 7 - New England states.

only 0.1 percent of the offshore catch in the fishery off Delaware Bay. The otter trawlers fish the inshore grounds in 6 to 12 fathoms east and southeast of the mouth of Delaware Bay and in the offing of Atlantic City, New Jersey, and Ocean City, Md. The offshore grounds are 30 to 60 miles southeast of Delaware Bay, out to 100 fathoms. The long-line vessels fish from just south of Ocean City, N. Y., to Winterquarter Lightship, immediately offshore of the 10-fathom isobath.

Vessels that land in New York City and Long Island ports fish Block Island Sound and the offing of Long Island. Some of the larger otter trawlers fish on Nantucket Shoals and Georges Bank in the summer and land their cod in New York City.

**NEW ENGLAND STATES:** The most productive U. S. grounds for cod are off the coasts of Maine, Massachusetts, and Rhode Island (fig. 7). Some cod from those grounds are landed by vessels that fish out of Connecticut and New Hampshire.



Table 3 - Annual Landings of Cod, Middle Atlantic States, by Gear, 1897-1962

Table 3 - Annual Landings of Cod, Middle Atlantic States, by Gear, 1897-1962																			
Year	NEW YORK						NEW JERSEY						DELAWARE						
	Otter Trawl	Hand Lines	Lines, Long or Set, with Hooks	Gill Nets	Pound Nets	Other	Total	Otter Trawl	Hand Lines	Lines, Long or Set, with Hooks	Gill Nets	Pound Nets	Other	Total	Otter Trawl	Hand Lines	Lines, Long or Set, with Hooks	Total	
1897	815	21	329	-	-	1/	1,165	319	5	2,080	-	-	1	2,405	-	-	32	3,602	
1898	362	18	618	-	-	1/	1,000	392	16	3,142	1/	3	-	3,553	-	-	19	4,570	
1899	1,051	28	876	-	-	1/	1,955	1,162	22	2,095	-	-	2	3,282	4	-	4	5,239	
1900	1,332	10	835	24	-	-	2,201	689	9	359	-	-	1	2,651	1/	-	1/	3,462	
1901	1,790	380	870	76	-	-	2,726	76	1	982	1/	1	-	3,039	-	-	-	2,156	
1902	1,860	4	978	116	-	1/	2,258	246	1/	685	1/	1/	-	3,189	-	-	-	3,189	
1903	855	1	408	28	-	-	1,292	201	-	82	-	2	1/	285	1/	-	1/	1,577	
1904	155	26	548	1	-	-	728	2	-	29	-	-	-	32	-	-	-	1,760	
1905	306	17	652	-	-	-	1,041	33	3	300	1/	9	-	307	-	-	-	1,282	
1906	1,024	50	865	-	-	2	1,941	33	6	552	-	5	-	600	-	-	-	2,541	
1907	1,482	205	839	-	-	-	2,528	132	6	845	-	-	-	988	1/	-	1/	3,516	
1908	1,547	6	784	7	2	1/	2,356	66	13	1,177	1/	130	-	1,386	-	-	-	3,743	
1909	1,446	-	293	-	3	2	1,744	257	3	683	1/	337	-	1,280	5	-	5	3,029	
1910	1,139	-	242	-	7	-	1,388	70	28	1,256	1/	60	-	1,414	2	-	-	2,804	
1911	1,963	56	1,145	-	20	-	3,184	-	-	-	-	-	-	-	-	-	-	3,184	
1912	1,139	10	585	-	11	-	1,745	782	66	1,396	1	147	2	2,394	32	5	-	4,176	
1913	1,671	50	574	-	5	1/	2,300	578	69	400	-	184	1/	1,231	-	-	18	3,549	
1914	2,100	-	506	-	4	-	2,610	202	49	1,492	-	170	1/	1,913	-	-	2	4,525	
1915	2,528	-	367	-	20	-	2,915	197	68	925	-	356	5	1,551	-	-	19	4,485	
1916	No survey	-	-	-	-	-	-	No survey	-	-	-	-	-	-	No survey	-	-	-	3,639
1917	2,006	24	681	-	6	-	2,717	5	18	829	-	37	1/	889	-	-	33	7,844	
1918	4,479	20	1,622	-	18	-	6,139	2	1	1,623	-	47	-	1,673	-	-	32	10,848	
1919	6,597	182	1,760	-	1/	-	8,539	120	15	1,910	-	206	1	2,252	-	-	57	6,415	
1920	1,676	271	1,837	-	19	-	3,803	41	19	2,245	-	189	70	2,564	-	-	48	-	
1921	693	2	340	-	2	-	1,037	7	7	763	-	42	-	819	-	-	-	1,856	
1922	No survey	-	-	-	-	-	-	No survey	-	-	-	-	-	-	No survey	-	-	-	7,491
1923	3,757	65	386	-	42	-	4,260	16	28	2,543	-	642	-	3,229	-	-	2	7,481	
1924	2,460	140	735	-	2	-	3,337	114	10	3,827	-	164	-	4,115	-	-	29	7,738	
1925	463	82	804	-	16	-	1,466	179	43	5,737	-	248	14	6,221	-	-	51	10,680	
1926	987	153	1,621	-	37	4	2,802	299	137	6,404	-	936	5	7,781	-	-	97	-	
1927	829	207	1,694	-	27	3	2,860	741	337	4,178	-	495	246	5,937	-	-	15	8,872	
1928	No survey	-	-	-	-	-	-	No survey	-	-	-	-	-	-	No survey	-	-	-	-
1929	(Kind not Specified)	-	-	-	-	-	-	(Kind not Specified)	-	-	-	-	-	-	(Kind not Specified)	-	-	-	-
1930	599	1,164	-	-	-	830	2,593	-	-	1,767	-	386	64	2,217	-	-	-	4,810	
1931	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1932	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1933	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1934	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1935	43	585	-	-	40	1/	668	-	-	607	-	80	-	687	-	-	-	1,355	
1936	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1937	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1938	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1939	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1940	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1941	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1942	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1943	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1944	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1945	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1946	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1947	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1948	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1949	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1950	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1955	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1956	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1957	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1958	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1959	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1961	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1962	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1/ Less than 500 pounds.  
- No survey.  
No statistics by gear incomplete.  
No statistics available.  
No survey.  
(Kind not Specified).

1/ Less than 500 pounds.  
 2/ No statistics available 1905-1920.  
 Note: Drawn or gutted fresh weight.

Cod landings from New England waters fluctuated from a high of 117 million pounds in 1895 to a low of about 21 million pounds in 1953. Landings at New England ports were supplemented, however, with cod caught by U. S. vessels on Browns Bank and other grounds in the offing of Canada. Thus, the low point for cod landed was approximately 32 million pounds in 1953 and again in 1957. Only about 7 percent of the cod landed by U. S. vessels is caught in the high seas off Canada. The landings by gear for the period 1928 to 1962 (table 4) show the same general decline for each of the states.

Although line trawls took most of the cod early in the century, otter trawls have taken an increasingly larger share since about 1908 and today are the most important gear in the New England cod fishery. Hand lines and line trawls still take fair amounts of cod off Massachusetts and Maine and are used to some extent off Rhode Island. Other types of gear include floating traps off Rhode Island, gill nets off Maine and Massachusetts, and pound nets off Massachusetts.

The New England cod fishery is a year-round fishery although the effort shifts seasonally from ground to ground. Most cod are caught by the large otter trawlers (fig. 8) that fish out of Boston for haddock. The most productive grounds are Georges Bank, Browns Bank, and Nantucket Shoals (see Schuck 1952 for a description of those grounds). Medium and small otter trawlers (fig. 9) fish many of the smaller grounds in the offing of Maine and Massachusetts.



Fig. 8 - A Boston large steel otter trawler.

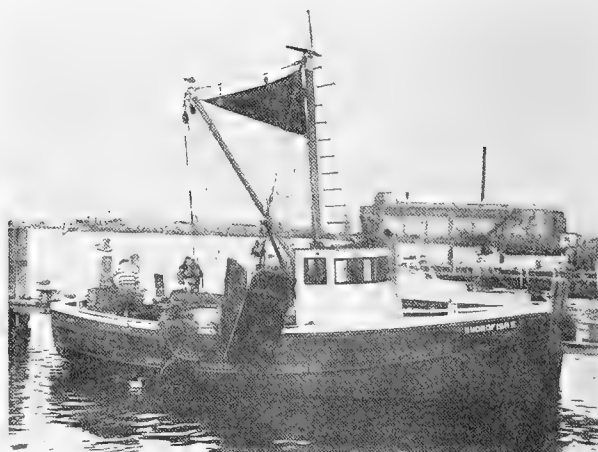


Fig. 9 - A small wooden otter trawler, or dragger.

The principal cod port for many years was Gloucester, but Boston now is the chief port. New Bedford ranks second in volume of cod landed, followed by Gloucester, Provincetown, and Portland, Maine.

#### MARKET FOR COD

In the beginning of the U. S. cod fishery, the bulk of the catch was split, salted, and dried. Only a small quantity from the shore fisheries, and during the winter from the bank fisheries, was landed fresh. Salt cod was once a staple food on both sides of the North Atlantic and, in addition, great quantities were exported in New England vessels to Africa in exchange for slaves, and to the West Indies (to feed the slaves on sugar cane plantations) in exchange for molasses to be made into rum. Today, no salted cod is produced in the United States; the slight market demand is satisfied with imports from Canada.

**UTILIZATION:** The evolution from a salt-cod market to a fresh and frozen cod market was largely the result of technological changes at sea and ashore, and ready acceptance of the new products by the public. The important factors that changed the utilization of cod are reviewed by Sette and Fiedler (1929).

July 1965

## COMMERCIAL FISHERIES REVIEW

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Table 4 - Annual Landings of Cod, New England States, by Gear, 1928-1962

MAINE							NEW HAMPSHIRE					MASSACHUSETTS							RHODE ISLAND							CONNECTICUT					Grand Total	
Year	Otter Trawl	Hand Lines	Lines, Long or Set, with Hooks	Gill Nets	Other	Total	Otter Trawl	Hand Lines	Lines, Long or Set, with Hooks	Other	Total	Otter Trawl	Hand Lines	Lines, Long or Set, with Hooks	Gill Nets	Pound Nets	Other	Total	Otter Trawl	Hand Lines	Lines, Long or Set, with Hooks	Floating Traps	Other	Total	Otter Trawl	Hand Lines	Lines, Long or Set, with Hooks	Other	Total	All Gear, All New England States		
	(1,000 Lbs.)																															
1962	1,096	225	223	580	-	2,124	No statistics available					36,424	1,264	1,636	490	5	10	39,829	No statistics by gear available						620	No statistics available					Incomplete by gear	
1961	1,163	143	418	783	-	2,507	-	-	30	-	30	33,659	752	2,183	1,555	3	13	38,165	762	117	96	91	-	1,066	364	36	-	-	400	42,168		
1960	1,362	341	339	855	-	2,897	-	-	20	-	20	27,112	1,027	1,978	1,142	2	4	31,265	456	143	78	146	-	823	225	24	-	-	249	35,254		
1959	1,162	195	429	907	-	2,693	-	-	-	-	-	32,755	438	1,944	1,417	4	18	36,576	824	188	190	43	-	1,245	242	1/	-	-	242	40,756		
1958	1,057	155	382	1,141	-	2,735	-	-	-	-	-	31,168	202	1,219	948	49	6	33,592	522	172	439	114	-	1,247	208	1	-	-	209	37,783		
1957	1,064	49	272	967	-	2,352	-	-	-	-	-	26,581	105	1,269	410	-	24	28,389	385	133	136	185	-	839	329	1	-	-	330	31,910		
1956	1,398	55	316	978	-	2,747	-	-	-	-	-	27,064	150	1,531	372	1/	11	29,128	389	128	106	110	-	733	154	-	-	-	154	32,762		
1955	1,311	178	429	945	-	2,863	-	-	-	-	-	25,606	155	2,138	612	1/	16	28,527	340	33	61	359	-	793	185	1/	-	-	185	32,368		
1954	1,780	513	504	891	1	3,690	-	-	-	-	-	27,180	213	1,894	700	1/	3	29,990	494	238	122	467	-	1,321	239	-	-	-	239	35,240		
1953	1,757	333	672	1,007	-	3,769	-	-	-	-	-	23,654	126	2,848	832	1/	5	27,465	141	354	49	63	-	607	58	1/	-	-	58	31,899		
1952	1,875	1,046	860	833	1/	4,614	-	6	10	-	16	32,301	163	3,720	720	7	17	36,928	215	367	-	91	1/	673	170	1/	-	-	170	42,401		
1951	2,258	918	1,097	1,020	1/	5,293	-	4	8	-	12	34,298	168	5,138	1,089	6	13	40,712	383	471	-	307	-	1,161	302	1/	-	1/	302	47,480		
1950	2,791	1,171	1,434	1,217	-	6,613	-	2	3	-	5	39,020	305	5,178	1,272	87	5	45,867	227	849	-	151	-	1,227	256	-	-	-	256	53,968		
1949	2,325	759	1,393	1,599	-	6,076	-	2	1	-	3	42,231	379	6,504	1,277	14	14	50,419	489	706	-	513	-	1,708	590	1	-	-	591	58,797		
1948	2,356	917	1,567	1,546	-	6,386	-	1	6	-	7	52,405	480	6,364	1,495	1/	1/	60,744	301	149	52	288	-	790	310	7	-	-	317	68,244		
1947	1,980	340	899	1,376	-	4,595	-	1	6	-	7	50,096	504	5,492	2,388	32	8	58,520	194	243	85	153	-	675	230	13	-	-	243	64,040		
1946	3,109	822	1,655	1,810	-	7,396	No survey					71,065	681	5,610	2,902	28	66	80,352	258	253	155	116	-	782	175	16	-	-	191	88,721		
1945	2,801	657	1,749	1,715	2	6,924	-	2	32	-	34	125,240	526	4,270	2,549	102	73	132,760	434	491	153	40	-	1,118	235	2	-	-	237	141,073		
1944	1,930	404	1,789	1,449	1	5,573	-	2	38	-	40	75,444	490	7,192	3,681	92	66	86,965	430	354	103	19	-	906	272	2	-	-	274	93,758		
1943	1,759	776	2,257	1,518	10	6,320	-	3	78	-	81	46,609	485	6,591	4,398	72	54	58,209	75	454	158	19	-	706	222	2	-	1/	224	65,540		
1942	1,846	1,167	1,259	667	1	4,940	-	-	35	-	35	45,370	743	9,798	3,293	86	82	59,372	29	423	190	22	-	664	81	-	-	-	81	65,092		
1941	No survey						No survey					No survey							No survey							No survey					No survey	
1940	651	206	1,698	633	1/	3,188	-	-	20	-	20	61,239	404	14,271	2,568	45	33	78,560	1	248	196	20	-	465	49	7	-	1/	56	82,289		
1939	496	123	2,012	696	1/	3,327	-	-	25	-	25	84,413	399	14,383	2,282	29	13	101,519	2	433	55	23	-	513	34	1/	-	-	34	105,418		
1938	500	413	3,076	2,231	-	6,220	-	-	2	-	2	94,266	174	14,589	2,191	22	72	111,314	17	612	94	13	-	736	100	11	-	-	111	118,383		
1937	355	794	3,273	2,627	-	7,049	-	-	1	-	1	106,155	170	16,802	3,140	14	46	126,327	19	863	165	20	-	1,067	157	2	-	-	159	134,603		
1936	No survey						No survey					No survey							No survey							No survey					No survey	
1935	552	506	3,992	3,358	-	8,408	-	11	3	-	14	77,734	673	27,022	5,143	15	47	110,634	6	403	166	33	-	608	161	4	505	-	670	120,334		
1934	No complete statistics						No complete statistics					No complete statistics							No complete statistics							No complete statistics					No complete statistics	
1933	766	1,108	3,356	4,106	-	9,336	-	-	29	-	29	51,228	2,205	32,813	3,085	3	55	89,209	5	610	164	128	1/	907	44	23	80	-	147	99,628		
1932	596	2,234	4,459	4,815	1/	12,104	-	4	51	-	55	38,000	1,687	28,653	3,111	4	26	71,481	66	461	152	42	1	722	1,482	61	370	-	1,913	86,275		
1931	446	2,156	5,551	4,499	1/	12,652	-	36	24	-	60	36,225	1,633	32,367	2,928	91	33	73,277	39	581	135	149	1/	904	5,129	76	424	-	5,629	92,522		
1930	784	1,797	7,906	2,997	-	13,484	-	-	158	-	158	40,219	3,362	29,647	4,199	42	54	77,523	80	942	188	332	11	1,553	8,829	-	86	-	8,915	101,633		
1929	931	2,720	10,862	3,148	-	17,661	-	-	4	-	4	19,907	3,928	35,831	4,344	51	85	64,146	119	1,570	543	273	6	2,511	2,452	86	139	-	2,677	86,999		
1928	64	2,282	9,228	4,613	1/	16,187	-	-	25	-	25	13,556	8,837	40,555	4,653	45	18	67,664	142	1,562	243	307	2	2,256	3,809	166	226	-	4,201	90,333		

1/ Less than 500 pounds.  
Note: Drawn or gutted fresh weight.

A steady downward trend in the landings of salted fish of all species began toward the end of the 19th Century. For example, in 1893, salted fish landings in Gloucester and Boston amounted to about 46 million pounds for all species, but by 1927 they declined to about 6.7 million pounds. The decrease was caused by lower landings of salted cod. In 1893, salted cod amounted to over 34 million pounds, and fresh cod to 20 million pounds. In 1927, salted cod amounted to about 2 million pounds and fresh cod to about 61 million pounds.

Before the development of efficient, inexpensive ways to manufacture ice, fishing vessels carried salt to preserve the catch at sea. The vessels were sailing schooners and the men fished with hand lines or long lines. Thus, it took longer to fill the holds with fish and longer to return to port.

Dramatic changes in the industry resulted from improved equipment to make ice, the introduction of otter trawls early in the present century, and the transition to steam (later diesel) engines for power. The vessels could carry enough ice to last the entire trip, the trawls caught large quantities of fish, and the vessels were able to spend far less time going to and from the banks.

Shortly after World War I, a quick-freezing process, readily adaptable to freezing fish, was developed. The industry began to market quick-frozen, boneless, ready-for-the-pan fillets that quickly changed the public's taste from salted to fresh fish. Those developments also helped contribute to the decline in the market for cod. Haddock, ocean perch or redfish (*Sebastes marinus*), and other species that did not salt well were widely marketed as frozen fillets.

Today, cod are landed in four market categories: scrod, 1½ to 2½ pounds; market, 2½ to 10 pounds; large, 10 to 25 pounds; and extra large, over 25 pounds. The domestic landings are filleted or steaked and sold fresh or frozen. A small quantity is frozen in blocks for manufacture later to fish portions and cooked breaded fish sticks.

Despite the decline in U. S. cod landings, high domestic consumption of the species is satisfied by large imports of cod fillets and blocks, mostly from Canada, Iceland, and Denmark. In 1963, about 180 million pounds of cod fillets and cod fillet blocks were imported.

### CONCLUSION

The U. S. cod fishery in the Northwest Atlantic has undergone many changes during the past 300 years. It began as a small boat, inshore fishery, but today is a large boat, offshore fishery. Technological improvements in handling and processing the catch helped decrease consumer demand for cod. Thus, the landings have declined to about one-third of what they were 50 to 75 years ago. The annual volume of the domestic catch, however, plus imports of frozen cod in several forms, suggest that the species plays and will continue to play an important economic role in fishing ports of the New England and Middle Atlantic states.

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## TUNA CREOLE CHOWDER FOR BUSY PEOPLE

Take a tuna chowder break. Here's a spicy quick chowder you can make in moments. As the Tuna Research Foundation points out, convenient canned tuna is high in protein and other essential nutrients. It helps you fix up a hearty and nourishing chowder.

Tuna Creole Chowder is thrifty, too. Even the delicate vegetable oil in which the tuna is packed is used in the recipe, to gently saute green pepper and onion. Tuna's mild taste and tender texture combine to a "T" with the subtle seasonings.

## QUICK TUNA CREOLE CHOWDER

2 cans (6 $\frac{1}{2}$ or 7 ounces each) tuna in vegetable oil	1 can (1 pound) corn
1 small onion, chopped	$\frac{1}{2}$ teaspoon salt
1 medium green pepper, chopped	$\frac{1}{2}$ teaspoon chili powder
1 clove garlic, minced	$\frac{1}{4}$ teaspoon thyme
1 can (10 $\frac{1}{2}$ ounces) bouillon	$\frac{1}{4}$ teaspoon Tabasco
1 can (1 pound) tomatoes	

Drain  $\frac{1}{4}$  cup oil from tuna into saucepan. Add onion, green pepper, and garlic; cook until onion is tender but not brown. Stir in remaining ingredients with tuna. Simmer 10 minutes. Makes 4 servings.

# SOME OBSERVATIONS ON THE DISTRIBUTION OF PENAEID SHRIMP IN EASTERN VENEZUELA<sup>1/</sup>

By N. Alam Khandker\*

## ABSTRACT

From the presence of larvae in the plankton samples and catching of adults in trawls a preliminary survey was made on the distribution and abundance of Penaeid shrimp around the Island of Margarita and in the Gulf of Paria. The species found around the Island of Margarita were Penaeus brasiliensis (brown), P. aztecus (brown), Xiphopenaeus kroyeri (sea bob), Hymenopenaeus robustus (royal-red), and Aristaeomorpha foliacea, and in the Gulf of Paria P. schmitti (white), P. aztecus, Xiphopenaeus kroyeri, and Trachypenaeus similis.

## INTRODUCTION

Off the eastern part of Venezuela there are vast ocean areas with depths of less than 100 fathoms. Those areas are part of the Continental Shelf around the Island of Margarita, the delta of the River Orinoco, and the Gulf of Paria. The Gulf of Paria has an average depth of only 10 fathoms with large estuarine areas. At present there is no offshore fishery for shrimp

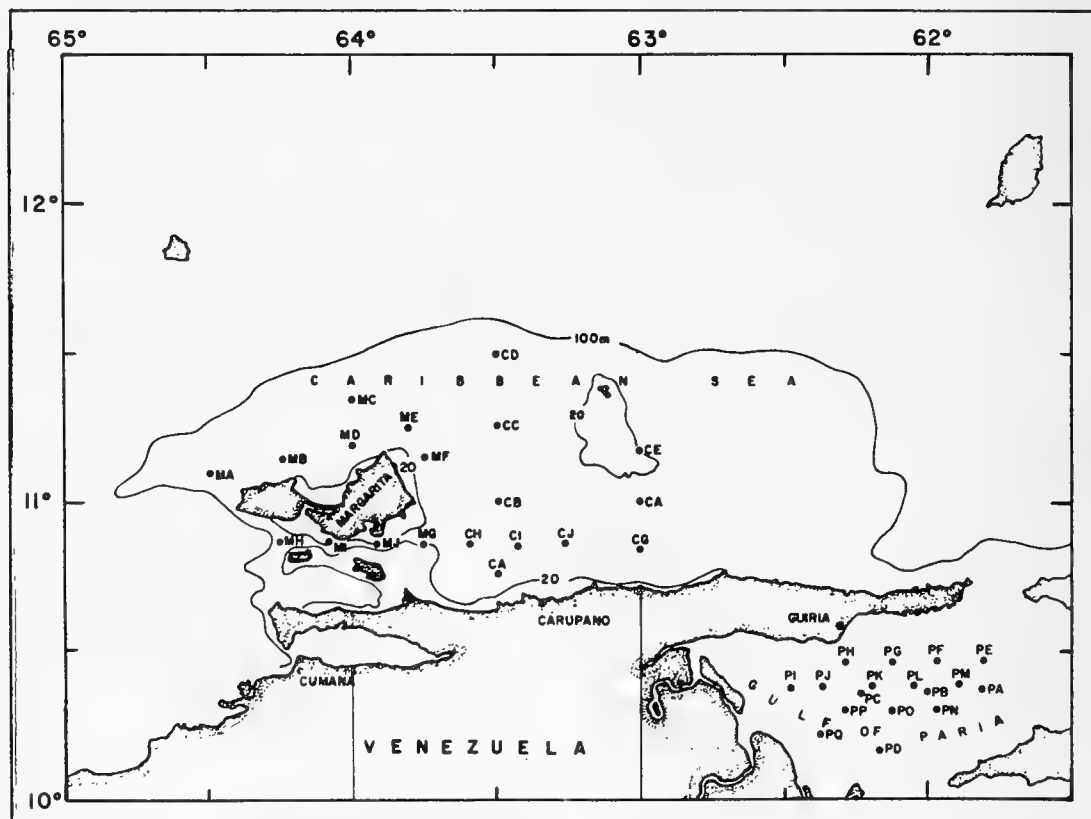


Fig. 1 - Shows 37 stations in April and August 1963 at which shrimp larvae were collected from plankton samples.

<sup>1/</sup>A part of the paper is based on some results of cruise 87 of the exploratory fishing vessel Oregon of the U.S. Bureau of Commercial Fisheries, Pascagoula, Miss.

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U. S. DEPARTMENT OF THE INTERIOR  
Fish and Wildlife Service  
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in that area. Apparently those areas seem to have potentiality and Fiedler (1947) indicated that there should be rich shrimp fishing grounds in the Gulf of Paria.

To find out the distribution and abundance it is necessary to do exploratory fishing. The only available information about exploratory fishing in those areas is of limited trawling done by the M/V Oregon of the U. S. Bureau of Commercial Fisheries in the delta of River Orinoco (Bullis and Thompson 1959). Plans were made to explore first the nearer waters, the Continental Shelf around the Island of Margarita, and the Gulf of Paria.

### METHODS AND RESULTS

As a preliminary step it was decided to look first for shrimp larvae as an indicator for the presence of adults. Shrimp larvae were collected from plankton samples at 37 stations (fig. 1) in April and August 1963. At every station a vertical haul was made for 15 minutes with a half-meter plankton net.

Table 1 - Number of Larvae Collected in April 1963

Stations	Depth		Penaeidae ..... (Number) .....	Penaeus
	Meters	Feet		
MA	26	85	385	0
MB	58	190	10	5
MC	32	105	5	0
MD	28	92	5	0
ME	30	98	0	0
MF	20	66	0	0
MG	25	82	55	55
CA	33	108	10	10
CB	46	151	0	0
CC	40	131	15	0
CD	67	220	20	0
CE	40	131	0	0
CF	50	164	0	0
CG	30	98	0	0
PA	25	82	10	0
PB	30	98	35	25
PC	20	66	10	10
PD	20	66	10	10

Table 2 - Number of Larvae Collected in August 1963

Stations	Depth		Penaeidae ..... (Number) .....	Penaeus
	Meters	Feet		
MH	63	207	105	0
MI	40	131	30	0
MJ	15	49	0	0
MG	25	82	50	30
CH	45	148	35	30
CI	50	164	190	190
CJ	59	194	15	15
PE	20	66	0	0
PF	30	98	0	0
PG	30	98	25	25
PH	20	66	0	0
PI	12	39	0	0
PJ	15	49	0	0
PK	25	82	0	0
PL	25	82	0	0
PM	30	98	0	0
PN	25	82	0	0
PO	30	98	0	0
PP	15	49	35	35
PQ	10	33	5	5

Tables 1 and 2 show the number of larvae at the different stations. Larvae of Penaeid shrimp were found in 20 stations, and in 12 stations larvae of the genus Penaeus. For lack of work on the early life history of many Penaeus sp. it was not possible to identify all the larvae to the specific level. However, an attempt was made to identify the postlarvae as suggested by Williams (1959). Accordingly, postlarvae at stations MG, CA, CH, CI, and CJ of the Caribbean Sea were identified as brown shrimp (P. aztecus). Postlarvae at stations PB, PC, PD, PG, PP, and PQ of the Gulf of Paria resembled that of white shrimp (P. setiferus) as described by Pearson (1939), but probably they were South American white shrimp (P. schmitti) which is the common species known from that area.

Later on in October of that year an opportunity was found to do some exploratory fishing when the author was invited to participate in cruise 87 of the Bureau of Commercial Fisheries exploratory fishing vessel Oregon. Through the cooperation of vessel scientific personnel it was possible to do some trawling in those areas. Drags of one hour's duration were conducted with a 40-foot flat trawl.

In one drag at 225 fathoms north of the Island of Margarita small quantities of royal red shrimp (Hymenopenaeus robustus) and another penaeid shrimp (Aristaeomorpha foliacea) were caught. Two other drags were made in the same area but in lesser depths, of which one produced 35 individual brown shrimp (Penaeus brasiliensis) at a depth of 35 fathoms. On the eastern side of the Island of Margarita 8 drags were made. Although most fishing was carried out at depths between 15 and 20 fathoms, the best catch, consisting of only 35 individual P. aztecus, was made in 35 fathoms north of Carupano.

Four drags were done in the Gulf of Paria. In depths greater than 10 fathoms a small number of P. aztecus were caught. Catches in lesser depths were also small. In one haul 35 and in another 50 P. schmitti were caught along with a few P. aztecus, Xyphopenaeus kroyeri, and Trachypenaeus similis.

The author did some trawling in the northern part of the Island of Margarita in March 1964. This was done with a 6 x 1½ foot "beam trawl." Xyphopenaeus kroyeri were found abundant at depths below 5 fathoms. Some P. brasiliensis were caught between 20 to 35 fathoms, but the quantity was always very small and did not suggest any possibility of commercial exploitation.

### CONCLUSION

The results of these explorations show that favorable trawling bottom exists in the eastern part of the Island of Margarita and in the Gulf of Paria and with the best showings of P. aztecus in the first mentioned area and of P. schmitti in the last mentioned area. It was further observed that in those areas shrimp have a different depth distribution than normally found in the Gulf of Mexico. Renfro and Brusher (1962) in their exploratory fishing reported the capture of the greatest number of P. aztecus between 15 to 20 fathoms. Kutkuhn (1962) also reported that in the Apalachicola area, year-round exploitation rarely goes beyond 20 fathoms. In the Gulf of Mexico white shrimp (P. setiferus) are mostly taken from 20 fathoms or less, but in the Gulf of Paria P. schmitti were found only in depths below 10 fathoms. However, more exploratory fishing will be necessary before the distribution and the abundance can be accurately delineated.



Fig. 2 - Research vessel Guaikeri of the Instituto Oceanografico, Universidad de Oriente, Cumaná, Venezuela.

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Created in 1849, the Department of the Interior--a department of conservation--is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States--now and in the future.

# TRENDS AND DEVELOPMENTS

## Alaska

### FOREIGN FISHING ACTIVITY OFF ALASKA, APRIL 1965:

U.S.S.R.: The Soviet trawling fleet off Southeast Alaska operated primarily in the area from west of Cape Ommaney northward to west of Cape Spencer throughout April 1965. But the size of that fleet became smaller as major trawl fisheries developed in other areas of the Gulf of Alaska. The trawling fleet off Southeast Alaska in April was composed of about 55 trawlers, 12 freezer vessels, and a few support vessels. Some of the vessels left the fleet early in April and for a short period fished off the west coast of Vancouver Island, British Columbia. Results of trawling in that area were apparently unsatisfactory for all the vessels reportedly returned to join the Gulf of Alaska fleets.



Fig. 1 - Soviet medium fish trawler (SRT) in Gulf of Alaska.

Another major Soviet trawling fleet began developing early in April south of the Kenai Peninsula between Middleton Island and Portlock Bank east of Kodiak. By the end of the month that particular fleet had been expanded and included about 70 vessels comparable to the trawling fleet off Southeast Alaska.

Soviet trawling efforts in the western Gulf of Alaska, primarily between Albatross Bank

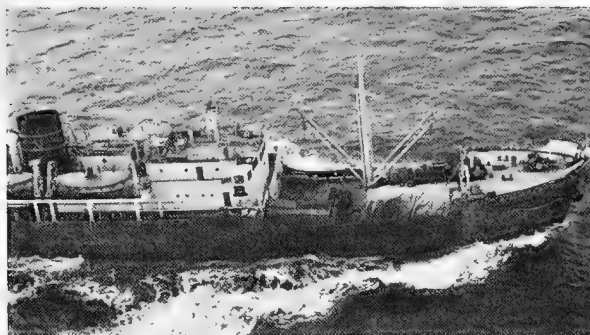


Fig. 2 - Soviet transport refrigerated vessel in Bering Sea.

off southwest Kodiak Island and the Shumagin Islands, were also increased during the month. About 30 trawlers and a few freezer vessels were believed working in the area, including about 8 BMRT factory trawlers. The factory trawlers appeared to be producing fish meal, but it was not known whether they were using whole fish or just fish wastes for meal production.

Observations throughout April were that the Soviet trawling fleets off Southeast Alaska, south of the Kenai Peninsula, and in the western Gulf of Alaska were fishing primarily for Pacific ocean perch, with no significant incidental catch of other species.



Fig. 3 - Soviet king crab factoryship Pavel Chebotmygin.

The Soviet flounder fishing fleet operating in outer Bristol Bay was disbanded by the close of the month, with many of the vessels

reassigned to trawling fleets in the Gulf of Alaska.

Soviet sources announced that 5 of their SRT-M type trawlers had been fishing shrimp in the Gulf of Alaska since February 1965, and that by late April had caught nearly 2½ million pounds of shrimp. It was reported that 2 additional SRT-M trawlers had recently been sent to the Gulf of Alaska to join the shrimp fishery. The Soviets were believed to be fishing the known stocks of shrimp in the Kodiak region where they conducted a shrimp fishery in fall 1964.

After moving out of the king crab pot sanctuary in late March, the king crab factoryship Pavel Chebotnyagin and her two sisterships Aleksandr Obukhov and Konstantin Sukhanov worked their tangle-net fishery northeast of Unimak Pass throughout most of April. Last April reports were that the Soviet king crab fleets were about 80 miles northwest of Port Moller in the same area as the Japanese king crab fleets.

Japan: A second shrimp fishing fleet, the factoryship Einen Maru, accompanied by 15 trawlers, began operations about 45 miles northwest of the Pribilof Islands in late April. The factoryship Chichibu Maru, which has 12 trawlers assigned to her, also operated on the accustomed shrimp fishing grounds north and west of St. Paul Island throughout April.



Fig. 4 - Japanese factoryship Einen Maru freezes and processes shrimp caught by its 15 trawlers.

The first of 7 Japanese fish meal fleets scheduled to operate in the eastern Bering Sea in 1965 appeared on the outer Bristol Bay "flats" in late April. That fleet, composed of the factoryship Gyokuei Maru and 26 trawlers, reportedly left Japan on April 9 and arrived on the fishing grounds 85 miles north of Unimak Pass about two weeks later.

Throughout April, the Japanese king crab fleets of the factoryships Tokei Maru and Tainichi Maru, with 10 tangle-net handling trawlers, operated in outer Bristol Bay northwest of Port Moller.

Japanese vessels did not participate in the halibut long-line fishery in the eastern Bering Sea which began in late March of this year. The only long-line fishing reported as of the end of April was the processing-fishing vessel Kotoshiro Maru, licensed to be accompanied by 3 long-line vessels, operating near Semipochnoi Island in the western Aleutians.



Fig. 5 - Workboat astern and wooden trawler alongside the Japanese fish meal factoryship Gyokuei Maru.

The Japanese factory trawler Tenyo Maru No. 3 was reportedly operating north of Atka Island in the central Aleutians in late April. It was believed that 5 other factory trawlers and one smaller side trawler said to be operating off Alaska were also fishing along the Aleutian Islands.



Fig. 6 - Fish on the foredeck of Japanese fish meal factoryship Gyokuei Maru.

All 4 of the Japanese trawlers licensed to operate in the Gulf of Alaska by May 1965 were fishing in the area in April. The ves-



Takachiko Maru fished for Pacific ocean perch southwest of Unimak Pass throughout April. The Taiyo Maru No. 82 shifted from the Bering Sea about mid-month and joined the Takachiko south of Unalaska Island. The Daishin Maru No. 12 alternated between Albatross Bank off southwest Kodiak and Portlock Bank east of Kodiak. Except for a brief period in early April when the Daishin No. 12 fished for shrimp off southwest Kodiak, her trawling efforts have been for Pacific ocean perch. The fourth Japanese Gulf trawler Akebono Maru No. 53 appeared on Albatross Bank about mid-April. All of those vessels are factory trawlers of 1,500 to 3,500 gross tons.

\* \* \* \* \*

#### ANNUAL KELP AND HERRING EGG HARVEST:

The annual harvest of kelp and herring eggs was conducted in the Sitka and Craig areas during April. Participation in that fishery has increased from 2 buyers in 1962 (the first year commercial harvesting was permitted by the state) to about 18 buyers in 1965. During the period, the price to the producer increased from 5 to 20 cents a pound and the number of producers has jumped from 40 to over 200. In 1962, about 48,000 pounds of kelp and herring eggs were harvested. The 1965 quota was set at 300,000 pounds, of which the Craig area was allotted 200,000 pounds and the Sitka area 100,000 pounds.

One processor, operating a fleet of 4 salmon seiners in the Sitka area, took an estimated 40,000 pounds of kelp and herring eggs. The seiners picked up the egg-laden kelp from harvesters working in skiffs. The seiners also provided the boxes and supplies to the harvesters and hauled the kelp to Craig where a crew of 50, working aboard scows, did the salting and packing. The method of processing involves packing 200 pounds of kelp into 30-gallon kegs, layered with 100 pounds of salt. Once filled, the kegs are flooded with saturated brine and sealed. The kegs, or barrels, are then shipped south ready for export to Japan.



### Alaska Fisheries Investigations

#### WINTER SURVIVAL OF PINK SALMON EGGS:

Pink salmon eggs in Southeast Alaska and parts of Prince William Sound seem to have

shown good survival in spite of severe low winter temperatures. A deep snow cover may have been the reason. Prince William Sound winter survival observations showed considerable variability in survival, with the excessive mortalities attributed to secondary effects of the severe earthquake of a year earlier. In many sections, areas with excellent egg survival were interspersed with areas of 100-percent mortality. An aerial photographic study during April of Prince William Sound pink salmon streams showed that aggradation, degradation, and channel relocations were still in progress as a result of land elevation changes during the earthquake.

\* \* \* \* \*

#### PINK SALMON TRANSPLANT SUCCESSFUL:

During fall 1964, biologists of the U.S. Bureau of Commercial Fisheries, in cooperation with Alaska's Department of Fish and Game, used a commercial fishing vessel equipped with live tanks to introduce 1,305 female pink salmon into Sashin Creek at Little Port Walter. The transplant produced about 310,000 preemergent alevins or about 14 percent of potential egg deposition, which is in the range of higher levels of fresh-water survivals observed previously at Sashin Creek. The production of 1964 brood year fry exceeded that of all other even-numbered brood years since 1942 and odd-numbered brood year fry for five years since 1941. Unless the introduced 1964 brood of pink fry experience a marine mortality in excess of 99 percent, the returning run in 1966 will be larger than the parent run.

The use of commercial fishing vessels equipped with live tanks makes it possible to capture large numbers of adult pink salmon and transport them to barren or low-producing streams at relatively low cost. This technique may allow the reestablishment of many runs previously destroyed, as well as allow the introduction of pink salmon in newly created spawning areas.

\* \* \* \* \*

#### BROOKS LAKE

##### RED SALMON FRY SURVIVAL:

A general appraisal of fresh-water mortality rates with the use of computer equipment shows that the average monthly mortality rates of red salmon fry have been 14.7 percent. An analysis of Brooks Lake red salmon stocks for the 1957-1961 brood years

shows monthly mortality rates ranging from 16.9 to 20.7 percent, indicating substantially lower survivals in Brooks Lake compared to the rest of the Naknek system. The Ugashik system shows an average monthly mortality rate of 14.2 percent.



## American Fishery Advisory Committee

### RECOMMENDATIONS MADE AT WASHINGTON, D. C., MEETING:

Increased development of the underutilized fishery resources of the United States was recommended by the American Fisheries Advisory Committee which met in Washington, D. C., during May 1965. The Committee, established in 1955 to advise the Secretary of the Interior on fisheries matters, concluded that a larger domestic fishery catch and a subsequent improvement of the American fishing industry would result in stronger competition with rising imports of fishery products.

A five-step program was outlined by the Committee as a means of increasing the commercial catch by United States fishermen:

- (1) Federal construction of one or more vessels of a proven type for use by the industry in demonstrating new methods of profitably harvesting underutilized fishery resources;
- (2) Automation of harvesting and processing techniques to reduce increasing labor costs;
- (3) Development of new and high-quality products with built-in marketing services designed to attract consumers;
- (4) Studies leading to establishment of uniform State commercial fishing regulations, and removal of those which unnecessarily inhibit development of fishery resources; and
- (5) Continuation of intensive efforts to develop an acceptable fish protein concentrate.

Other recommendations made by the Committee included enactment of legislation to extend the Fishery Loan Program, scheduled for termination on June 30, 1965, and the continuation of research on the effects that pesticides, pollution, and the destruction of fish spawning and nursery areas have on fishery resources.

Staff members of the U. S. Fish and Wildlife Service briefed the Committee on domestic and international problems affecting the United States fishing industry; fisheries leg-

islation; oceanography; quality improvement in fishery products; special programs involving the International Biological Program, International Cooperation Year, the Potomac River Project, and the program of the Bureau of Commercial Fisheries during fiscal year 1966.

The Committee agreed that development of an acceptable fish protein concentrate would provide the domestic fishing industry with a market for underdeveloped fishery resources readily available in coastal waters. Scale models of fish protein concentrate processing-units developed by the U. S. Bureau of Commercial Fisheries at Beltsville, Md., were inspected by the Committee during the Washington, D. C. meeting.

Note: See Commercial Fisheries Review, December 1964 p. 25.



## California

### PELAGIC FISH POPULATION SURVEY CONTINUED:

M/V "Alaska" Cruise 65-A-2-Pelagic Fish (April 1-10, 1965): The objectives of this cruise by the California Department of Fish and Game research vessel Alaska in the coastal waters of southern California from Huntington Beach to Ventura were to: (1) experiment with the midwater trawl to improve its effectiveness as a sampling device (general objectives were to improve net opening, ease of handling, and fishing-depth determination); (2) test the wireless depth telemetering system in the field and develop operational techniques; (3) evaluate two small midwater trawls for possible use on pelagic fish surveys; and (4) observe anchovy schooling behavior and reaction to midwater trawling.

The large (50-foot) midwater trawl used on the cruise was fished with various otter door hook-ups and net-spreading devices. The best apparent net opening was obtained with regular large hydrofoil doors positioned 3 fathoms in advance of the headrope, and some new hydrofoil quarter-doors  $1\frac{1}{2}$  fathoms ahead of the footrope. The upper bridle was  $46\frac{1}{2}$  fathoms long, and the lower was 45. Twenty-four trawl floats were attached to the headrope. This arrangement gave a vertical net opening of 42 feet and an estimated 40- to 45-foot horizontal opening. The most significant improvements obtained were a greater

horizontal spread of the foot rope and easier handling during the setting operation. The longer bottom bridles caused the net to fish 5 fathoms deeper than previously.

Net fishing depths were determined at various speeds and with various amounts of cable. The ratio of cable out to fishing depth ranged from 6.5 to 1 with 40 fathoms out to 3 to 1 with 200 fathoms out. The net reacted slowly to speed and cable length changes. It usually required 5 or more minutes for the net to stabilize at a constant depth.

A wireless depth telemetering system (Furuno Net Sonde model FNZ-5) was tested with excellent results. With that system, net depth, fish schools, and sea bottom are simultaneously displayed on an echo-sounder depth recorder. A dial readout is also provided for more precise net depth determinations. The system was operated to its maximum depth of 65 fathoms and performed well under all weather conditions.

A 25-foot midwater trawl was fished to determine its value as a sampling device on pelagic fish surveys. But the trials were limited by extremely poor weather and a scarcity of fish. Comparative advantages over the large net were ease and safety of handling, reduced manpower requirements, and the ability to operate under more adverse weather conditions.

A 10-foot midwater trawl was fished from a skiff. Small hydrofoil doors gave an excellent horizontal spread but excessive door resistance and small mesh size reduced towing speed. Such a trawl may be useful for capturing fish samples in extremely shallow bays, or in "dirty" water. The vessel's 50-foot trawl was towed toward anchovy schools located visually. Aircraft and vessel observations showed the schools moved out of the vessel's path as it approached, with the result that catches were small or nonexistent. Many small anchovy schools were located by echo-sounder in deep water during daylight hours. Tows made through those areas yielded up to 150 pounds in a 20-minute tow. With the approach of darkness those anchovy schools scattered and rose close to the surface.

The weather was bad throughout the cruise and curtailed much of the scheduled work. No large concentrations of fish were located or fished during this cruise.

Note: See Commercial Fisheries Review, May 1965 p. 13.

## Central Pacific Fisheries Investigations

### FORECAST FOR SUMMER 1965

#### HAWAIIAN SKIPJACK TUNA FISHERY:

Environmental conditions for catching skipjack tuna (aku) in Hawaiian waters looked favorable starting in February this year, according to scientists of the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii, who predict that the summer 1965 skipjack tuna catch will be average or above average.

The skipjack is Hawaii's dominant fishery, with about 10 million pounds landed every year. The peak of the catch is midsummer and the July take is about 10 times that in February.

The Bureau's Honolulu Laboratory's scientists have found that at least two environmental conditions affect the availability of skipjack during the summer. One is the type of water around the islands during the peak fishing season. The other environmental condition is the time that the nearshore waters start to become warmer in late winter or early spring. Running westward across the Pacific lies one of the major oceanic currents, the California Current Extension, which sweeps from the coast of Mexico to join the Equatorial Current west of the international date line. Its waters are lower in salinity than those of the adjacent North Pacific Central Water. In most summers, the northern edge of the California Current Extension moves northward, bathing the Hawaiian Islands in warm water of low salinity.

When the water starts warming up in early February and when the lower salinity water reaches the islands in the summer, the skipjack tuna catch is good, or has been for the 13 years for which precise records of the U. S. Bureau of Commercial Fisheries are available. When the water warms up in late March and the lower salinity water does not reach the islands in summer, the catch is low. When one of those conditions occur but not the other, the skipjack catch is about average.

The Bureau scientists say that no one can yet predict whether the lower salinity water will or will not reach the islands, but the onset of the warming trend is readily measured.

This year (1965), the scientists say initial warming of the water began late in February,

which is one indication that the 1965 skipjack tuna catch will be average or possibly above average. Annual mean salinities this past April seemed to show a declining trend. On that basis, an oceanographer of the Bureau's Honolulu Biological Laboratory concluded that the environmental conditions looked favorable and that average or above average availability of skipjack in Hawaiian waters could be expected during summer 1965.

\* \* \* \* \*

#### TUNA BEHAVIOR AND RESPONSE TO SIGNALS STUDIED:

Live tuna caught in Hawaiian waters during an April 1965 cruise by the U. S. Bureau of Commercial Fisheries research vessel Charles H. Gilbert were returned to the Bureau's Biological Laboratory at Kewalo Basin, Honolulu, Hawaii, for fish behavior studies. A total of 68 live tuna in the Laboratory's holding tanks were being taught to respond to simple electrical and acoustical signals in the course of research on what and how well tuna hear and see.



Fig. 1 - Behavior study tank (without quonset hut mounted) for skipjack tuna.

The information gained from the fish behavior studies is a basic requirement if fishing techniques are to be significantly improved, says the Area Director of the U. S. Bureau of Commercial Fisheries at Honolulu. The fish behavioral work is directed by a scientist of the Bureau's Honolulu Biological Laboratory who is assisted by a group of biologists who know more about the world of the tuna, probably, than anyone else anywhere.

One of the interesting results that has come out of those studies is knowledge that tuna really cannot see nor hear very well, in

the human sense. Work at the laboratory has shown that tuna cannot distinguish forms of objects underwater nearly as well as humans can. One of the laboratory biologists did this by giving himself and his coworkers the same tests he gave the fish. The biologist who is studying how well tuna hear finds they are most responsive to sounds near 500 cycles a second and are deaf to sounds higher than 2,000 cycles a second. The human ear, by comparison, hears sounds up to 15,000 cycles a second or more.

At the Bureau's laboratory, daily training sessions are held with the tuna. In learning ability, the fish are much like people, the biologists say. Some are very quick to learn, others seem to learn nothing. The "star pupil" was a skipjack tuna that learned the simple visual acuity routine in 3 days. If a fish does not learn within 1 week, it is replaced with another.



Fig. 2 - Skipjack tuna behavior study tank with quonset hut mounted.

The tuna collected by the Bureau's research vessel Charles H. Gilbert cruise were caught on Penguin Bank and on the leeward side of Oahu between Honolulu and Kaena Point. Tuna caught at sea were placed in portable tanks aboard the vessel. On return to the laboratory at Kewalo Basin, they were put in 24-foot portable swimming pools which constitute the fish-testing facility. Tuna are very sensitive to handling. It is only after a long period of research at the Bureau's Honolulu Laboratory that methods have been designed to keep them alive for long periods.

Note: See Commercial Fisheries Review, May 1965 p. 41.

\* \* \* \* \*

#### TRADE WIND ZONE OCEANOGRAPHIC STUDIES CONTINUED:

M/V "Townsend Cromwell" Cruise 14 (March 8-28, 1965): A predominantly south-westerly flow south of the Hawaiian Islands and a variable and complex flow to the south again was the characteristic flow pattern of

the area investigated during the March 1965 cruise of the research vessel Townsend Cromwell. The vessel, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii, on March 28 completed the 13th in a series of oceanographic cruises to determine the rate of change in the distribution of properties in the trade wind zone of the North Pacific Ocean. The area of operations was in the Central North Pacific bounded by latitudes 10° N., 27° N., and longitudes 148° W., 158° W.

The flow pattern observed during March, like that from the previous month's cruise, differed from the flow pattern of a year earlier. The eddies observed during this latest cruise were less well developed in the northern portion of the cruise area while the southwesterly flow in the southern portion was stronger. As compared with observations in February 1965, the more sharply sloping depth of the 20° C. isotherm surface showed that the latter flow had intensified. A complex system of eddies still remained east of the islands during this latest cruise.

During the cruise, surface temperatures began to rise to 26° C. (78.8° F.) south of 16° N., an increase of 1° C. since the previous cruise. North of 20° N., however, cooling had continued. The lowest temperature recorded was 20.5° C. (68.9° F.) in the northeastern corner, a drop of 0.5° C. since February.

A total of 43 oceanographic stations was occupied along the cruise track. At each station temperatures and samples for salinity analyses were obtained at depths to 1,500 meters (4,921 feet). In addition, deep casts to 4,000 meters (13,123 feet) were taken at stations 21 and 25 and a cast to 5,000 meters (16,404 feet) was taken at station 38.

Bird flocks sighted during the cruise numbered 43 as compared with 41 in February. In contrast with the previous month's cruise when most were sighted in the southeastern section of the cruise area, the bird flocks were concentrated in latitudes north and south of the islands along 154° W. and 157° W.

Other operations during the cruise included taking the usual series of bathythermograms, sea surface temperatures (including the use of a Hytech salinity-temperature-depth situ recorder on an experimental basis),

release of drift bottles, and other oceanographic data.

Note: See Commercial Fisheries Review, May 1965 p. 15.



## Federal Purchases of Fishery Products

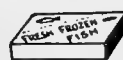
### DEFENSE DEPARTMENT'S NEW INSPECTION REQUIREMENTS FOR CHILLED AND FROZEN FISH:

New inspection requirements, effective July 6, 1965, for chilled or frozen fish purchased under Federal Specification PP-F-381 by the U. S. Department of Defense were announced in Headquarters Notice to the Trade No. 44 (65) of May 3, 1965, issued by the Defense Subsistence Supply Center (DSSC), Chicago, Ill.

The new inspection requirements are contained in DSSC Articles 345 of July 6, 1965 (which replace DSSC Articles 345 of January 4, 1965), and will be cited in DSSC contracts for chilled or frozen fish awarded on and after July 6, 1965.

Copies of the revised inspection requirements may be obtained from regional offices of the Defense Subsistence Supply Center.

Note: See Commercial Fisheries Review, Feb. 1965 p. 41.



## Fish Species Identification

### NEW AND QUICK METHOD DEVELOPED FOR SPECIES IDENTIFICATION OF PROCESSED PRODUCTS:

A new and simple, but precise, method for identifying the species of processed fish has been developed by the U. S. Bureau of Commercial Fisheries Technological Laboratory, Gloucester, Mass. The species of fish can be positively identified in less than an hour by this new method of identification. It is considered a major improvement over other species identification methods which require more time and more highly trained personnel.

The new technique developed by the Bureau's Gloucester Technological Laboratory uses cellulose polyacetate strip electrophoresis to separate the soluble protein of fish muscle into patterns thereby establishing a distinctive fingerprint for each species of fish. The method can be applied under field





Fig. 1 - Equipment used in new quick method of identifying species of processed fish.

conditions by anyone without special training in laboratory techniques. This testing method will be an invaluable tool to processors and buyers in positively identifying fish used in preparing processed fishery products such as fish sticks, fish portions, and other processed fishery products.

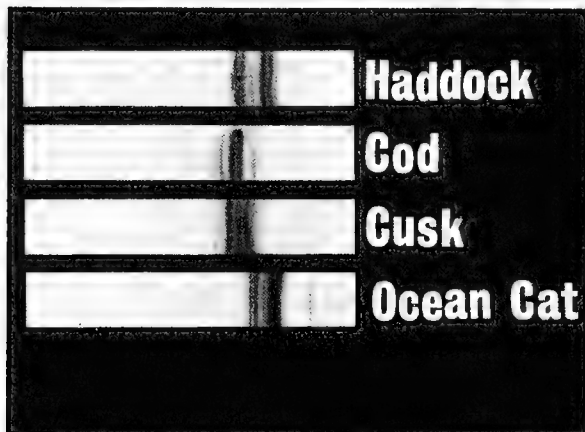


Fig. 2 - Shows identifying species patterns obtained by new method of identifying species of processed fish.

Members of the fishery and related industries were invited to attend a meeting June 4, 1965, at the Bureau's Gloucester Technological Laboratory to observe demonstrations of this new procedure.



## Great Lakes Fisheries Explorations and Gear Development

### SEASONAL DISTRIBUTION AND ABUNDANCE STUDIES OF ALEWIFE, CHUB, AND YELLOW PERCH IN LAKE MICHIGAN:

M/V "Kaho" Cruise 24 (April 13-28, 1965): This 15-day cruise was the first this year in a continuing series to extend knowledge on the seasonal distribution and abundance of alewife and chub stocks in Lake Michigan and Green Bay and their availability to bottom trawls. Other objectives of the cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel *Kaho* were to: (1) collect growth data on chub, alewife, and yellow perch for biological investigations; (2) collect fish and bottom samples for botulism studies; and (3) obtain sculpin samples for technological analyses. The cruise plan was altered with fishing effort shifted to a station in the southern portion of the lake because of ice conditions in northern waters.



Fig. 1 - A 1,500-pound lift of alewife by a Lake Michigan trawl vessel.

Commercially significant quantities of alewife were caught only off Port Washington, Wis. Catches of alewife were extremely light at all depths off Ludington, Mich., and Manitowoc, Wis. Alewife were absent from all trawl catches made in Green Bay and virtually absent in the open lake off Sturgeon Bay. Chub catches were generally light in all areas fished. Only a small amount of yellow perch was taken—one individual in the open lake and a total of 56 pounds in Green Bay.

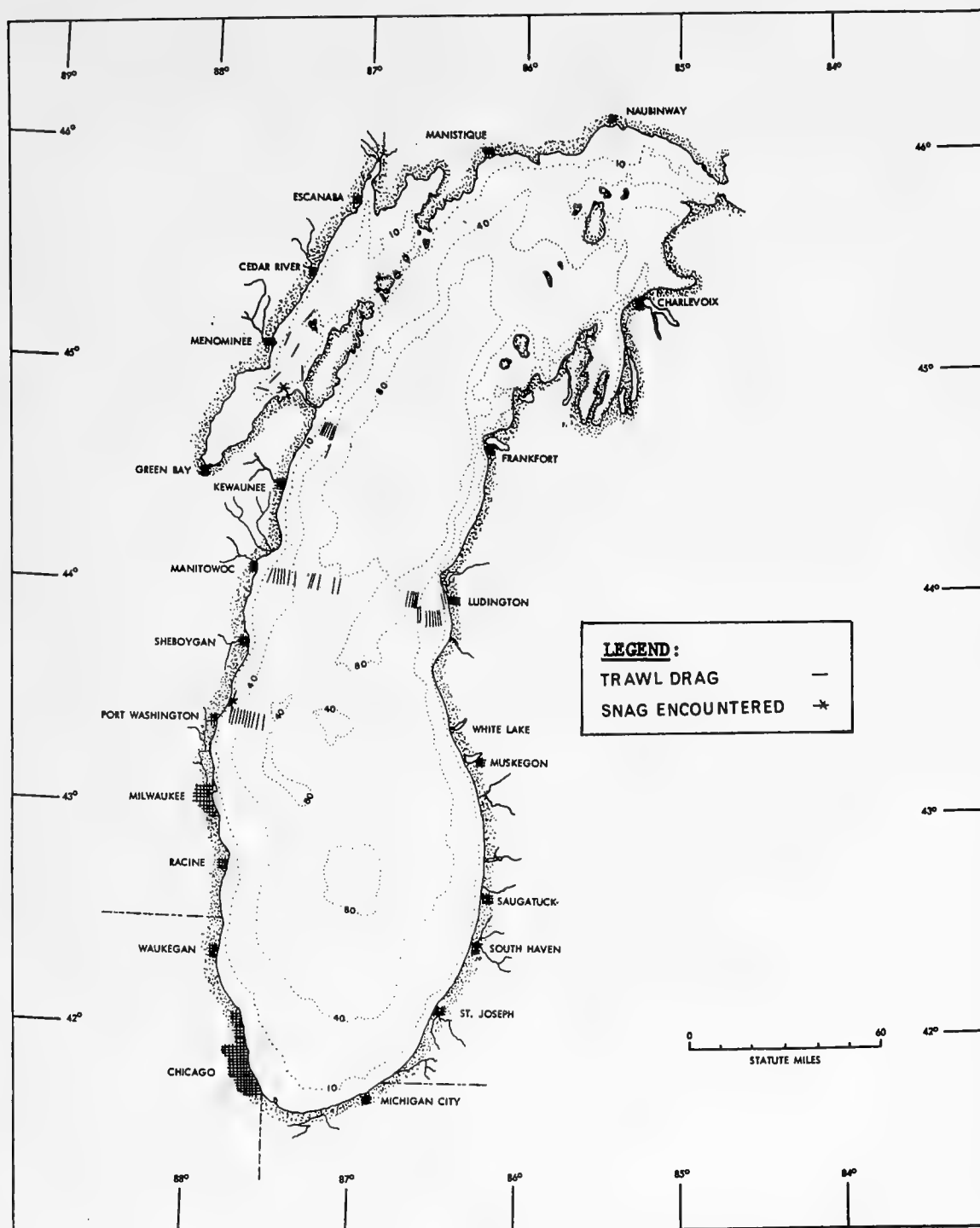


Fig. 2 - Lake Michigan and Green Bay explorations by M/V Kaho Cruise 24 (April 13-28, 1965).

**LAKE MICHIGAN COMMERCIAL ALEWIFE PRODUCTION SUMMARY:** Lake Michigan alewife were not as readily available to

commercial trawlers early in 1965 as in 1964 when ice and storm conditions were much less severe. Commercial trawlers started making

large catches off Benton Harbor, Mich., and off Racine, Kenosha, and Manitowoc, Wis., about the same time as the vessel *Kaho* came up with good catches off Port Washington during this cruise. City water officials in Chicago also reported heavy concentrations of alewife plugging screens on Lake Michigan water intakes at the same time.

From all indications, the Lake Michigan alewife population appeared to still be on the increase. The 1964 commercial production of about 10 million pounds was more than double that of 1963. No alewife at all were caught commercially prior to 1956. Biologists of the U. S. Bureau of Commercial Fisheries reported that young-of-the-year alewife in 1964 were nearly 50 times as abundant as in 1962. Two fish meal plants built in Milwaukee and Sturgeon Bay, Wis., in 1964 should make it possible for Lake Michigan commercial fishermen to increase production of alewife substantially. Additional economic benefits to commercial fishermen would result and at the same time provide some degree of control over the population explosion of the troublesome alewife.

**FISHING OPERATIONS:** A total of 52 drags was completed with a 52-foot (headrope) fish trawl--mostly in the open lake, and 7 in Green Bay. All drags lasted 30 minutes except 7, which were terminated early due to snags, gear malfunction, or the presence of set-fishing gear. Moderate trawl damage occurred during one drag which encountered a snag in Green Bay. Bottom topography and vertical distribution of fish were continuously monitored during the cruise and recorded with a high-resolution echo-sounder.

**FISHING RESULTS IN LAKE MICHIGAN:** The fishing transect conducted between Ludington and Manitowoc showed alewife to be virtually absent at all depths fished in Michigan waters, with the best catch of 20 pounds taken at 70 fathoms. Catches of alewife in Wisconsin waters were insignificant, with the best catch (220 pounds) made at 60 fathoms. Commercially significant quantities of alewife were taken off Port Washington at depths from 20 to 45 fathoms, with best catches (1,600 and 1,700 pounds) made at 25 and 30 fathoms, respectively.

Chub catches were light at all depths fished during the lake-wide transect, with the best catch on the east shore amounting to 126 pounds taken at 35 fathoms. The best chub

catch on the west shore amounted to 180 pounds, also taken at 35 fathoms. Catches of that species were insignificant off Port Washington, with the best one of 80 pounds taken at 40 fathoms. Chub which measured 9 inches and over in length accounted for 38 percent by weight of all chub caught during the cruise.

Species other than alewife and chub in southern Lake Michigan included very small quantities of herring, sculpin, smelt, and yellow perch.

Except for 3 pounds of alewife caught at a depth of 40 fathoms, no fish were taken in 7 drags made between 15 and 45 fathoms off Sturgeon Bay, the only station that was monitored. Two of the drags made at 40 and 45 fathoms were terminated early because of gill nets that had been set in the area.

The M/V *Kaho* was scheduled to start another cruise from Ludington on May 11, 1965, to continue investigations in connection with technical assistance by the U. S. Bureau of Commercial Fisheries to the Lake Superior fishing industry program. The purpose of the later cruise was to determine the potential of developing more effective and efficient methods for catching and handling Lake Superior commercial fish.

Note: See Commercial Fisheries Review, January 1965 p. 30.



## Gulf Fisheries Explorations and Gear Development

### SHRIMP GEAR STUDIES CONTINUED:

M/V "George M. Bowers" Cruise 59 (April 19-May 5, 1965): To observe and record on movie film the escape patterns and rates of deburrowing of shrimp from different bottom types when the shrimp were exposed to various electrical voltages was the first objective of this 16-day cruise to the Tortugas shrimp grounds. The exploratory fishing vessel George M. Bowers, operated by the U. S. Bureau of Commercial Fisheries, had SCUBA divers record with hand-held cameras the reaction of individual shrimp as they were stimulated by electrical charges.

The second objective of the cruise was to determine and record on movie film the behavior pattern of shrimp when stimulated by the electrodes of the electrified shrimp trawl.



Experimenting with the response of shrimp to electricity in an aquarium at U. S. Bureau of Commercial Fisheries Laboratory.

To accomplish this a TV camera was mounted on the housing of the movie camera, which was secured to the headrope of the trawl. When shrimp appeared on the screen of the TV monitor aboard the vessel, the movie camera was actuated by remote control from the vessel, and the action was thus recorded. Bad weather caused turbid water conditions and restricted to a degree the underwater photographic work.

Preliminary information on the rate of deburrowing of pink shrimp was obtained on two different types of bottom. A total of 500 feet of colored motion-picture sequences recorded the behavior pattern and the time for individual shrimp to deburrow when stimulated with pulsating d. c. current ranging from 0.8 to 6.0 volts. Corroboration by laboratory experiments in February 1965 and underwater diver observations made during this cruise indicate that shrimp deburrow faster when stimulated with high voltages as opposed to low voltages.

Black and white movies also taken during this cruise on the trawl-mounted camera will provide information on the behavior of shrimp in the vicinity of the electrodes and footrope of the electrical shrimp trawl.

Note: See Commercial Fisheries Review, May 1965 p. 21.



## Gulf Fishery Investigations

### SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-28 (April 15-22, 1965): Good catches of large brown shrimp (15-20 count) were made in several

of the statistical areas worked during this cruise by the chartered research vessel Gus III. The vessel, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex., covered 8 statistical areas on this April cruise, another of a series in a continuing Gulf of Mexico shrimp distribution study.

Weather was excellent during the cruise and 28 standard 3-hour tows with a 45-foot flat trawl were made. Other operations in connection with the study included 50 plankton tows, 52 bathythermograph (BT), and 157 water (Nansen bottle) casts.

Catches of brown shrimp predominated in nearly all areas. White shrimp catches were mostly spotty throughout the survey area, but with fair catches (15-20 and 26-30 count) from areas 13 and 16.

The best brown shrimp catch (54 pounds of 15-20 count) of the cruise was in area 14 from the over 21-fathom depth. Area 19 yielded 33 pounds of 26-30 count brown shrimp from the 11-20 fathom depth range; 27 pounds of 15-20 count brown shrimp came from the over 21-fathom depth of area 16.

Other moderate to good catches of brown shrimp were 18 pounds (21-25 count) in the over 21-fathom depth of area 21; 15 pounds (26-30 count) in 11-20 fathoms of area 20; 12 pounds (21-25 count) in the 11-20 fathom range of area 18.

Only a scattering of pink shrimp were taken from the areas covered, the largest catch being 6 pounds (68 count) from the up to 10-fathom depth in area 21.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.

(2) See Commercial Fisheries Review, June 1965 p. 25.



## Industrial Fishery Products

### U. S. FISH MEAL, OIL, AND SOLUBLES:

Major Indicators for U. S. Supply, February 1965: United States production of fish meal and fish solubles in February 1965 was lower by 2.4 and 11.4 percent, respectively, as compared with February 1964. Production of fish oil was up by 108.7 percent.

Major Indicators for U.S. Supply of Fish Meal, Solubles, and Oil, February 1965

Item and Period	1/1965	1964	1963	1962	1961
(Short Tons) . . . . .					
<b>Fish Meal:</b>					
<b>Production:</b>					
January . . . . .	2,770	2,092	2,335	2,941	2,723
February . . . . .	2,257	2,313	2,897	3,616	2,071
Jan.-Feb. 2/ . . . .	5,027	4,405	5,232	6,557	4,794
Year 3/ . . . . .	-	235,252	255,907	312,259	311,265
<b>Imports:</b>					
January . . . . .	16,033	30,975	18,495	25,427	9,531
February . . . . .	25,480	35,309	40,086	18,819	14,344
Jan.-Feb. . . . .	41,513	66,284	58,581	44,246	23,875
Year . . . . .	-	439,143	376,321	252,307	217,845
<b>Fish Solubles 4/:</b>					
<b>Production:</b>					
January . . . . .	907	1,501	1,662	1,808	1,620
February . . . . .	803	906	1,465	1,726	1,650
Jan.-Feb. 2/ . . . .	1,710	2,407	3,127	3,534	3,270
Year 3/ . . . . .	-	93,296	107,402	124,649	112,254
<b>Imports:</b>					
January . . . . .	650	358	148	273	219
February . . . . .	1,665	524	169	2,249	155
Jan.-Feb. . . . .	2,315	882	317	2,522	374
Year . . . . .	-	4,505	7,112	6,308	6,739
(1,000 Lbs.) . . . . .					
<b>Fish Oils:</b>					
<b>Production:</b>					
January . . . . .	573	526	491	769	473
February . . . . .	478	229	358	408	356
Jan.-Feb. 2/ . . . .	1,051	755	849	1,177	829
Year 3/ . . . . .	-	180,198	185,827	250,075	258,118
<b>Exports:</b>					
January . . . . .	-	165	79	509	13,449
February . . . . .	-	23,533	2,458	21,647	17,456
Jan.-Feb. . . . .	-	23,698	2,537	22,156	30,905
Year . . . . .	-	151,469	262,342	123,050	122,486

1/Preliminary.  
 2/Data for 1965 based on reports which accounted for the following percentage of production in 1964: Fish meal, 89 percent; solubles, 89 percent; and fish oils, 99 percent.  
 3/Small amounts (10,000 to 25,000 tons) of shellfish and marine animal meal and scrap not reported monthly are included in annual totals.  
 4/No homogenized fish was produced in 1964.

\* \* \* \* \*

**Production by Areas April 1965:** Preliminary data on U.S. production of fish meal, oil, and solubles for April 1965 as collected by the U.S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

U.S. Production 1/ of Fish Meal, Oil, and Solubles, April 1965 (Preliminary) with Comparisons			
Area	Meal	Oil	Solubles
	Short Tons	1,000 Pounds	Short Tons
<b>April 1965:</b>			
East & Gulf Coasts . . . .	9,184	10,009	3,004
West Coast 2/ . . . . .	1,705	230	1,142
Total . . . . .	10,889	10,239	4,146
<b>Jan.-Apr. 1965</b>			
Total . . . . .	18,674	11,832	6,944
<b>Jan.-Apr. 1964</b>			
Total . . . . .	15,651	5,824	7,293

1/Does not include crab meal, shrimp meal, and liver oils.

2/Includes American Samoa and Puerto Rico.

\* \* \* \* \*

**Production, February 1965:** During February 1965, a total of 478,000 pounds of marine animal oils and 2,257 tons of fish meal was produced in the United States. Compared with February 1964 this was an increase of 249,000 pounds of marine-animal oils but a decrease of 56 tons of fish meal and scrap. Fish solubles production amounted to 803 tons--a decrease of 103 tons as compared with February 1964.

U. S. Production of Fish Meal, Oil, and Solubles, February 1965 1/ with Comparisons

Product	Feb.		Jan.-Feb.		Total 1964
	<u>1/1965</u>	1964	<u>1/1965</u>	1964	
	. . . . . (Short Tons). . . . .				
<u>Fish Meal and Scrap:</u>					
Herring . . . . .	298	156	542	415	8,881
Menhaden 2/. . . . .	-	-	3/	130	160,349
Tuna and mackerel . . . . .	1,635	1,486	3,549	2,125	21,113
Unclassified . . . . .	324	671	936	1,735	34,809
Total . . . . .	2,257	2,313	5,027	4,405	225,152
Shellfish, marine-animal meal and scrap . . . .	<u>4/</u>	<u>4/</u>	<u>4/</u>	<u>4/</u>	10,100
Grand total meal and scrap . . . . .	<u>4/</u>	<u>4/</u>	<u>4/</u>	<u>4/</u>	235,252
<u>Fish solubles:</u>					
Menhaden . . . . .	-	-	-	60	68,738
Other . . . . .	803	906	1,710	2,347	24,558
Total . . . . .	803	906	1,710	2,407	93,296
	. . . . . (1,000 Pounds). . . . .				
<u>Oil, body:</u>					
Herring . . . . .	124	8	287	132	10,354
Menhaden . . . . .	-	-	2/	63	157,730
Tuna and mackerel . . . .	254	112	490	339	4,816
Other (including whale) . .	100	109	274	221	7,298
Total oil . . . . .	478	229	1,051	755	180,198

1/Preliminary data.

2/Includes a small quantity of thread herring.

3/Included in "unclassified."

4/Not available on a monthly basis.

1/Preliminary data.  
 2/Includes a small quantity of thread herring.  
 3/Included in "unclassified."  
 4/Not available on a monthly basis.

\* \* \* \* \*

## U. S. FISH MEAL AND SOLUBLES:

**Production and Imports, January-February 1965:** Based on domestic production and imports, the United States available supply of fish meal for the first 2 months in 1965 amounted to 46,540 short tons--24,149 tons (or 34.2 percent) less than during the same period in 1964. Domestic production was 622 tons (or 14.1 percent) more but imports were 24,771 tons (or 37.4 percent) lower than in January-February 1964. Peru continued to lead other countries with shipments of 32,512 tons.

The United States supply of fish solubles during January-February 1965 amounted to 4,025 tons--an increase of 22.4 percent as compared with the same period in 1964. Domestic production dropped 29.0 percent, but imports of fish solubles increased 162.5 percent.



U.S. Supply of Fish Meal and Solubles, January-February 1965					
Item	January		Jan.-Feb.		Total 1964
	1/1965	1964	1965	1964	
	. . . . . (Short Tons). . . . .				
<b>Fish Meal and Scrap:</b>					
Domestic production:					
Menhaden	2/	130	2/	130	160,349
Tuna and mackerel	1,914	639	3,549	2,125	21,113
Herring, Alaska	244	259	542	415	8,881
Other	612	1,064	936	1,735	44,909
Total production	2,770	2,092	5,027	4,405	235,252
<b>Imports:</b>					
Canada	2,408	4,150	6,046	7,803	54,769
Peru	11,933	25,090	32,512	55,222	348,025
Chile	1,102	-	2,080	1,051	12,942
So. Africa Rep.	-	1,528	200	1,678	18,581
Other countries	590	207	675	530	4,826
Total imports	16,033	30,975	41,513	66,284	439,143
Available fish meal supply	18,803	33,067	46,540	70,689	674,395
<b>Fish Solubles:</b>					
Domestic production 3/	907	1,501	1,710	2,407	93,296
<b>Imports:</b>					
Canada	100	85	249	345	1,553
So. Africa Rep.	-	109	-	339	987
Other countries	550	164	2,066	198	1,965
Total imports	650	358	2,315	882	4,505
Available fish solubles supply	1,557	1,859	4,025	3,289	97,801
1/Preliminary. 2/Included with "other." 3/50-percent solids.					



## Maine Sardines

### CANNED STOCKS, APRIL 1, 1965:

On April 1, 1965--just before the new packing season opened--canners' stocks of Maine sardines were down sharply from those of the same date in 1964 and 1963.

Final data show the 1964 pack as 865,751 standard cases (100 cans of  $3\frac{3}{4}$ -oz.) canned in 23 plants in Maine. (Partially included is a small winter 1964/65 pack from Canadian fish of 40,000 cases.) That was much less than the 1,619,000 cases packed during 1963,

but more than the 754,000 cases packed during the regular season in 1961 when fishing was extremely poor.

The new Maine sardine canning season opened on the traditional date of April 15, 1965. But in the light of past experience, volume production was not expected until late May or early June. With carryover stocks at a low level, a pack of 1.5 to 1.6 million cases has been predicted for 1965.

The new law legalizing year-round canning of Maine sardines will remove the traditional December 1 closing date for the packing season. The new legislation will open winter canning to all Maine sardine packers and will allow winter canning with domestic as well as imported herring.

Note: See Commercial Fisheries Review, April 1965 p. 23.



## Marketing

### EDIBLE FISHERY PRODUCTS, 1964 AND FIRST HALF OF 1965:

Total supplies in the United States of edible fishery products in 1964 dropped only fractionally from the previous year's all-time high. U. S. imports of fish and shellfish again rose and provided nearly half the total available supplies for the year. The 1964 domestic fishery catch was below the previous year.

Supplies of fishery products were sufficient during the year to maintain the U. S. per capita consumption of fish and shellfish at 10.6 pounds (edible weight). Per capita consumption of canned fishery products declined in 1964, offsetting an increase in consumption of fresh and frozen fishery products.

More salmon, blue and king crab, haddock, and yellowfin tuna were landed in 1964. But

Canned Maine Sardines--Wholesale Distributors' and Canners' Stocks, April 1, 1965, with Comparisons 1/

Type	Unit	1964/65 Season			1963/64 Season					1962/63 Season			
		4/1/65	1/1/65	11/1/64	7/1/64	6/1/64	4/1/64	1/1/64	11/1/63	7/1/63	6/1/63	4/1/63	1/1/63
Distributors	1,000 actual cases	236	238	291	234	254	291	261	308	217	215	264	271
Canners	1,000 std. cases 2/	314	538	629	514	499	658	1,063	1,255	643	536	699	1,092

1/ Table represents marketing season from November 1-October 31.

2/ 100  $3\frac{3}{4}$ -oz. cans equal one standard case.

Note: Beginning with the Canned Food Report of April 1, 1963, U.S. Bureau of the Census estimates of distributors' stocks were based on a revised sample of merchant wholesalers and warehouses of retail multiunit organizations. The revised sample resulted in better coverage. The January 1, 1963, survey was conducted with both samples to provide an approximate measure of the difference in the two samples. That survey showed that the estimate of distributors' stocks of canned Maine sardines from the revised sample was 13 percent above that given by the old sample.

Source: U.S. Bureau of the Census, Canned Food Report, April 1, 1965.

catches of other species were significantly lower than the previous year, including Atlantic herring (sardines), shrimp, ocean perch, West Coast mackerel, albacore, bluefin, and skipjack tuna, and North Pacific halibut.

Frozen stocks of fishery products on hand at the beginning of the second quarter 1965 were down more than a tenth from a year earlier. Cold-storage holdings of cod, haddock, and ocean perch fillets were substantially lower. Stocks of fish sticks and portions, halibut, whiting, shrimp, and spiny lobster tails were below those for the same period a year earlier. Crab and crab meat (mostly king crab) were among several frozen items held in larger quantity than in 1964.

Although fishing effort is this year increasing seasonally, supplies will likely continue limited during the second quarter 1965 and prices will average higher than a year earlier. Nearly half of the domestic catch of edible fish will be landed during June-September, with the peak reached in July and August. As a result, stocks of many popular frozen fishery products will not be replenished until then.

Present market conditions point to increased imports of edible fishery products this year, particularly shellfish products and groundfish (cod, haddock, etc.) blocks for producing fish sticks and portions. The United States continues to be the world's largest importer of fishery products even though unused resources with a potential, perhaps as much as five times the present catch, are available in waters usually fished by United States fishermen.

Note: This analysis was prepared by the Bureau of Commercial Fisheries, U. S. Department of the Interior, and published in the Department of Agriculture's May 1965 issue of the National Food Situation (NFS-112).



## Mussels

### TENNESSEE RIVER HARVEST DECLINE RELATED TO OVERFISHING:

Overharvesting has played a definite part in the decline of Tennessee River mussel beds. That was announced in a progress report issued in early May 1965 on a Tennessee Valley Authority (TVA) study of the problem begun in 1963.

A mussel takes at least 10 years to grow a marketable shell, and TVA biologists es-

timate the mussel boats have been taking shells from the Tennessee about 20 times as fast as they were being replaced by natural growth. The 1964 mussel harvest on the river dropped to a record low of only 2,100 tons valued at about \$294,000. In previous years the harvest had often been above 10,000 tons, valued at up to \$1.3 million.

The growing demand from the Japanese cultured pearl industry, which uses bits cut from the mussel shells as cores for pearls, has brought high prices in recent years, and this has encouraged heavier mussel fishing. The States are moving to meet the problem with limits on harvesting. Tennessee already has passed a licensing and control law, and Alabama and Kentucky agencies are considering similar regulations.

TVA biologists using a sampling dredge and SCUBA diving equipment examined over 500 miles of Tennessee River bed, from Watts Bar Dam in east Tennessee to the river's mouth. The examinations showed that in most cases areas which formerly were productive mussel beds now have only a fraction of the mussels there in past years.

Little evidence has been found to indicate water pollution or disease as causes of the decline, although the more valuable mussel species will not tolerate the thin film of silt that now covers much of the old river bottom.

The best Tennessee River mussel beds now are in areas downstream from the dams, where there is enough current to keep the river bottom clean. Over 175 miles of river channel is still good habitat for the preferred commercial mussel species, and overharvesting is considered the main cause of the population decline in those areas.

Copies of the progress report on the mussel study are available from TVA and from State conservation agencies. A detailed report will be published in January 1966. Meanwhile, a TVA biologist will continue some aspects of the study. More work will be done on the possible effects of changes in fish populations (a young mussel spends part of its life cycle as a parasite on certain fish), on water quality, and on possible disease or parasite infestation. (Tennessee Valley Authority, May 6, 1965.)

Note: See Commercial Fisheries Review, October 1963 p. 27.



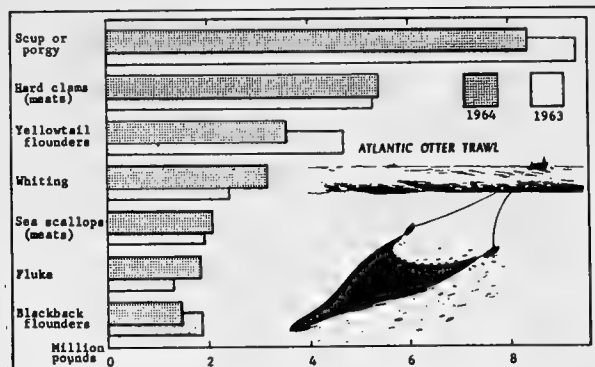
## New York

### FISHERY LANDINGS, 1964:

Total landings of fish and shellfish in the Marine District of New York during 1964, exclusive of unclassified fish for reduction, were 79.2 million pounds valued at \$9.9 million ex-vessel. Compared with 1963, that was a decrease of 38 percent in quantity, but an increase of 7 percent in value. Lighter landings of menhaden, scup, and yellowtail and blackbackflounders accounted for most of the decline in finfish landings. Shellfish, with the exception of oysters, showed an increase, with total landings up 11 percent in quantity and 19 percent in value. In terms of total value, shellfish (\$6.8 million) exceeded the value of all finfish by \$3.8 million.

The 1964 catch of menhaden was down 54 percent from 1963. The menhaden fishery was at its lowest ebb in many years. The industrial fishery for species other than menhaden has developed into a large-scale operation, compensating in part for the short supply of menhaden.

Lighter landings of scup or porgy (down nearly 1 million pounds from 1963) were the



New York State marine catch of certain fish and shellfish, 1964 and 1963.

result of reduced catches by otter trawls. Because of the short supply, prices remained high and the total ex-vessel value of the species in 1964 was equal to that of the previous year.

The pound-net fisheries showed improvement only in the catch of scup. It was generally a poor season. The fishing effort in Raritan Bay has declined steadily due to poor fishing and is expected to decrease further.

New York Marine Landings, 1964 and 1963

Species	1964		1963 1/	
	Pounds	Value	Pounds	Value
<b>Fish:</b>				
Bluefish . . . . .	675,115	109,426	696,750	102,295
Butterfish . . . . .	1,066,655	126,161	1,151,041	147,966
Cod . . . . .	516,500	72,220	882,200	137,659
Flounders: Gray sole . . . . .	14,620	2,072	9,200	1,140
Blackback . . . . .	1,440,640	74,031	1,842,525	98,483
Yellowtail . . . . .	3,561,810	233,403	4,668,675	287,940
Fluke . . . . .	1,853,780	445,448	1,305,865	368,564
Unclassified . . . . .	900	45	400	16
Menhaden . . . . .	42,424,700	516,226	91,650,540	1,013,680
Scup or porgy . . . . .	8,343,820	783,648	9,307,715	783,613
Sea bass . . . . .	500,740	95,821	576,360	108,664
Striped bass . . . . .	965,500	138,439	626,100	94,061
Whiting . . . . .	3,123,200	159,323	2,367,660	111,415
Unclassified fish . . . . .	3,198,340	260,785	3,193,670	244,349
<b>Total Fish . . . . .</b>	<b>67,686,320</b>	<b>3,017,048</b>	<b>118,285,651</b>	<b>3,499,845</b>
<b>Shellfish:</b>				
Lobsters, Northern . . . . .	546,715	305,747	380,055	210,204
Clams: Hard . . . . .	5,402,292	4,135,545	5,311,032	3,581,797
Razor . . . . .	5,856	1,464	8,432	2,257
Soft . . . . .	180,832	55,677	98,592	27,527
Surf . . . . .	1,217,676	108,852	974,304	90,524
Conchs . . . . .	40,950	7,989	22,320	4,797
Mussels, Sea . . . . .	124,950	16,512	74,340	10,604
Oysters . . . . .	213,468	315,037	394,468	572,688
Scallops: Bay . . . . .	687,096	731,474	302,374	291,676
Sea . . . . .	2,044,332	1,114,682	1,924,371	894,620
Squid . . . . .	1,007,130	74,008	872,120	67,825
<b>Total Shellfish . . . . .</b>	<b>11,471,297</b>	<b>6,866,987</b>	<b>10,362,408</b>	<b>5,754,519</b>
<b>Grand Total . . . . .</b>	<b>79,157,617</b>	<b>9,884,035</b>	<b>128,648,059</b>	<b>9,254,364</b>

1/Revised. In addition to the catch in the Marine District there was a catch, principally shad, in the Hudson River District in 1963 totaling 250,000 pounds valued at \$27,000.

Note: Does not include the catch of unclassified fish for reduction. Univalve and bivalve mollusks are reported in pounds of meats. All other species are shown in round weight.

The 1964 commercial catch of striped bass in New York was the largest on record. The major catch was made by haul seines. Due to the quantity available, the ex-vessel price was not high in 1964, ranging around 15 cents a pound.

Landings at New York City's Fulton Fish Market in 1964 totaled 6.4 million pounds, a decrease of 16 percent, or 1.2 million pounds less than in 1963. The decline was due chiefly to a drop in landings of scup the early part of 1964. Sea scallop landings increased and held steady through the year.

Hard clam production increased slightly in quantity and 15 percent in value as compared with 1963. There was an increase in the catch by dredges and a decline in the catch by other gear. Oyster production continued to decline with prospects for immediate improvement doubtful. In-the-shell oysters for the half-shell trade sold at very high prices, ranging from \$11-\$15 a bushel. The bay scallop harvest came back strong after a very poor start.

\* \* \* \* \*

#### NEW SITE FOR WHOLESALE NEW YORK CITY FISH MARKET APPROVED:

The Site Selection Board of New York City on April 26, 1965, gave its unanimous approval to the City's acquisition of 100 acres of land in the Hunts Point section of the Bronx, contiguous to the 126-acre New York City Produce Terminal, for the establishment of a wholesale fish and a wholesale meat market. The combined produce, meat, and fish sections of that facility will form the world's largest perishable food distribution center.

The proposed fish and meat markets will be designed to house the fish dealers located in the existing Fulton Fish Market and the wholesale butchers in the present 14th Street, Brook Avenue and Harlem Meat Markets in modern quarters with truck loading platforms and direct rail connections. The new facility is planned to have 300-foot wide market streets to eliminate traffic congestion and will be provided with ample parking space. During the planning period, the consultants will work closely with the dealers to include all desirable features to make the



Gloucester trawler Manuel P. Domingos docked in New York City's Fulton Fish Market. In the background is the "Old Shed," the older of two sheds used to sell and handle the salt-water fish received by truck, rail, and steamship from all over the world.

new wholesale market facility the most efficient possible.

Note: See Commercial Fisheries Review, November 1964 p. 40.



## North Atlantic

### SOVIET FISHING ACTIVITY OFF COAST, MAY 1965:

A total of 57 Soviet vessels was observed in the North Atlantic during the early part of May 1965 when an aerial reconnaissance flight was made to observe foreign fishing activity. The vessels sighted were identified



Fig. 1 - Soviet factoryship stern trawler of 300 feet, fishing the northern edge of Georges Bank in the North Atlantic.

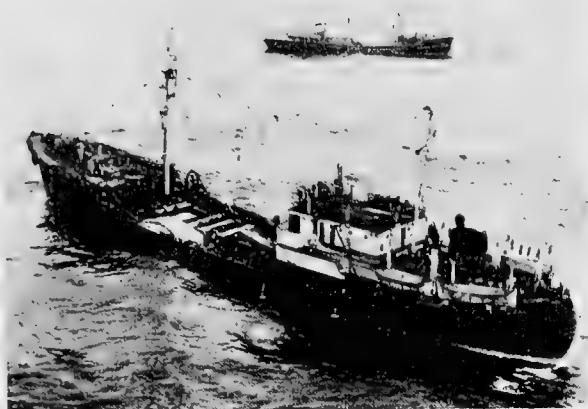


Fig. 2 - In the foreground, a 500-ton Soviet side-fishing trawler operating in the Grand Banks area of the North Atlantic.

as 22 factoryship stern trawlers, 27 side trawlers, 7 refrigerated fish transports, and 1 tug. Fishing operations were widely scattered over a 100-mile area from south of Nantucket Island to the southwest part of Georges Bank (Oceanographer Canyon), with the heaviest vessel concentration at the latter position.

Soviet vessels fishing areas south and southeast of Nantucket Island about early May were taking substantial quantities of red hake and lesser amounts of whiting. The main group of vessels on Georges Bank were catching herring mostly, and some whiting. Reduction plants on several of the stern trawlers were in operation.



Fig. 3 - Majakovskij class Soviet factoryship stern trawler in the North Atlantic. Equipped to freeze, can, and process fish meal and oil.

During a reconnaissance flight about mid-month, 19 Soviet vessels were sighted--4 factoryship stern trawlers, 11 side trawlers, 3 refrigerated transports, and 1 tanker. The area covered started south of Nantucket Island and included the area between Atlantis Canyon and Corsair Canyon along the 100-



Fig. 4 - A Soviet combination-type 145-foot vessel capable of drift gill-net fishing or trawling. Herring catches are salted in barrels and later transferred to a mothership.

fathom contour. Vessels were fishing and catches appeared to be spotty, consisting mostly of herring.

On another flight toward the end of the month, 20 Soviet vessels were spotted and identified as 16 side trawlers, 1 factoryship stern trawler, and 3 support vessels. None was fishing. Most of them appeared to be either transferring or waiting to transfer their catches. This flight covered the Continental Shelf area northeastward a distance of 90 miles, and the south and western portion of Georges Bank. Visibility was very poor because of fog.



Fig. 5 - Refrigerated fish transport used by Soviets in North Atlantic fishery to transport fishing vessel catches to the U.S.S.R.

These observations were made by the staff of the Fisheries Resource Management Office, U. S. Bureau of Commercial Fisheries, Gloucester, Mass. Weekly reconnaissance flights are made in cooperation with the U. S. Coast Guard.

Note: See Commercial Fisheries Review, June 1965 p. 27.



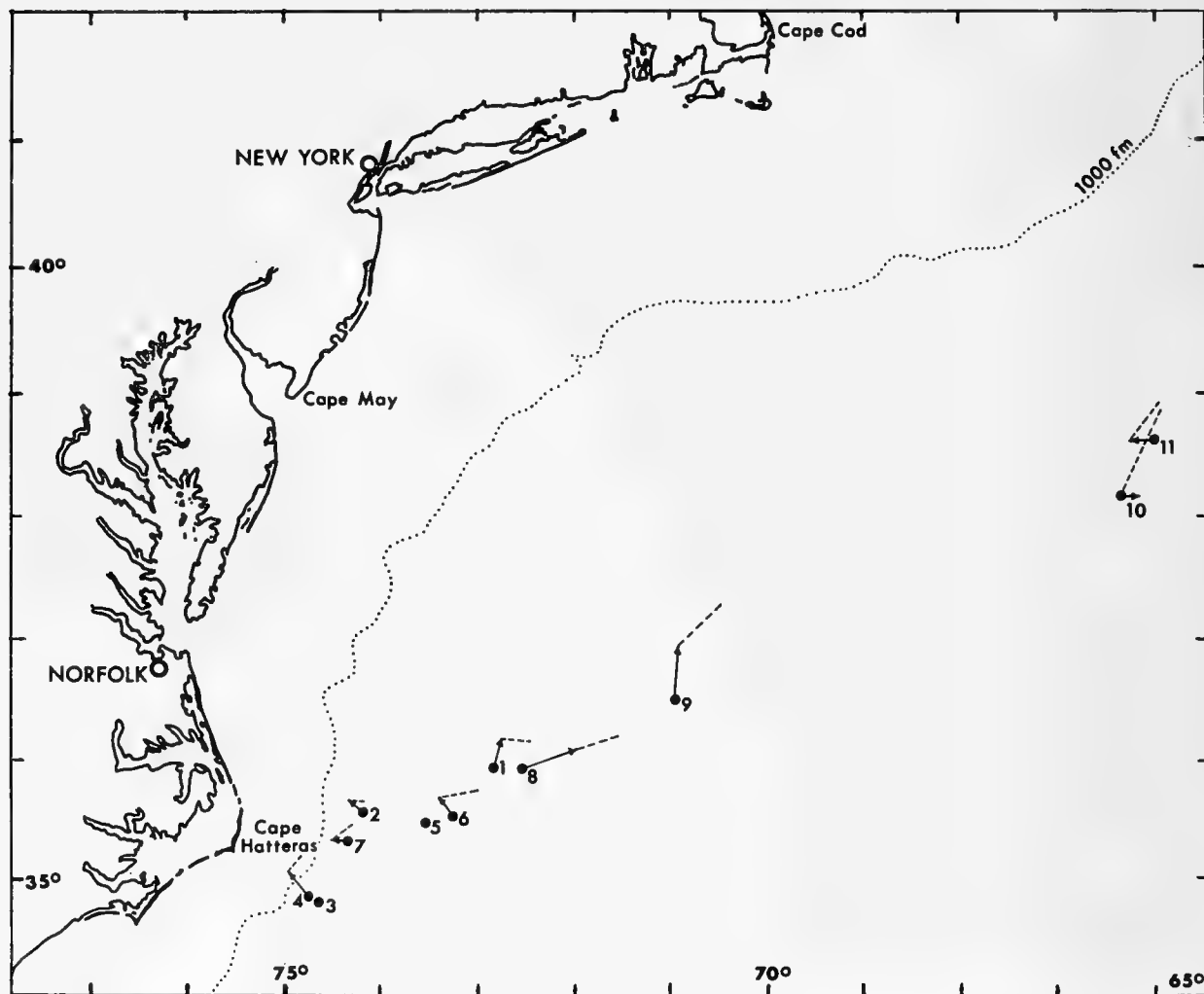
## North Atlantic Fisheries Explorations and Gear Development

### TUNA AND SWORDFISH DISTRIBUTION STUDIES IN WESTERN NORTH ATLANTIC CONTINUED:

M/V "Delaware" Cruise 65-3 (March 30-April 23, 1965): Bluefin (*Thunnus thynnus*) and yellowfin tuna (*Thunnus albacares*) were caught during long-line investigations by the U.S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware along the north frontal edges of the Gulf Stream east of Cape Hatteras. The two-part cruise was designed principally to survey tuna distribution and abundance in areas which had not been previously investigated at that time of year.

**LONG-LINE SETS AND CATCH:** Eight sets of long-line gear were made during daylight hours and one set was made at night, with a total of 4,400 hooks fished. Hooks baited with squid and herring were spaced at 20-fathom intervals and fished at depths below 15 fathoms.

Bluefin tuna were found at 5 stations with catch rates of 3.3 and 3.2 fish per 100 hooks at 2 of those stations. This is the highest bluefin catch rate recorded for the month of April in the area fished and is evidence that more than scattered numbers of this species may be available in the area of the Gulf Stream immediately adjacent to Cape Hatteras during early spring. Average round weight of bluefin taken during the cruise was 245 pounds and the weight range was 173-372 pounds.



Shows station pattern of M/V Delaware Cruise 65-3 (March 30-April 23, 1965). Drift of long-line sets is shown by dashed line.



Previous long-line catch data for yellowfin tuna in that region from late April through May indicated substantial concentrations (M/V Delaware cruises in April-May 1960 and April-June 1964) when up to 14 and 19 fish per 100 hooks were recorded. Special effort was made on this cruise to determine the availability of such abundances earlier in the month of April. Results of the survey suggest yellowfin were entering the area at that time. The species was taken at 5 stations, with the highest catch rate of 3.8 fish per 100 hooks at the station worked on April 15. The average round weight of yellowfin tuna on the cruise was 85 pounds and the weight range was 33-149 pounds.

Albacore tuna (Thunnus alalunga) were found in very small numbers at 5 stations, with the highest catch rate 1.0 fish per 100 hooks at one of those stations. The average round weight of albacore tuna was 45 pounds, and the weight range was 37-55 pounds. Two skipjack (Euthynnus pelamis) tuna weighing 34 and 15 pounds were taken, 1 at each of 2 stations worked. They were the first skipjack taken earlier than May north of Cape Hatteras. A single bigeyed tuna (Thunnus obesus), estimated weight 100 pounds, was taken at one station, and a single swordfish (Xiphias gladius) of 158 pounds was caught at the only night long-line station worked.

Other incidental long-line catches during the cruise were: 1 longbill spearfish (Tetrapturus pfluegeri), 1 blue marlin (Makaira nigricans), 6 white marlin (Tetrapturus albidus), 3 wahoo (Acanthocybium solanderi), and 1 sharp-tailed mola (Mola lanceolatus).

**ENVIRONMENTAL DATA VS. TUNA AVAILABILITY:** General areas containing desirable environmental conditions for tuna availability were through analysis of sea surface temperature isotherm charts received by radiofacsimile equipment aboard the vessel. Specific locations for long-line sets were determined on the basis of supplementary surface and vertical (subsurface) temperature profile data obtained within the general area. All sets were positioned in relation to cold/warm water interfaces (steep horizontal thermal gradients) associated with the frontal edges of the Gulf Stream.

A total of 7 sets as made toward or across the interfaces to determine tuna availability within the general temperature gradient structure. Results at those stations indicated that tuna were associated with the mixed surface

layer on the warmer side of the interfaces. Two sets at 2 separate stations were positioned, based on information from the other sets, in the warmer water and about parallel to the interface. Those 2 sets not only yielded the highest tuna catches of the cruise, but their comparative catch composition indicated displacement of bluefin concentrations by yellowfin concentrations over a one-week period (April 8-15).

**MODIFICATIONS TO LONG-LINE DECK GEAR:** Several modifications to long-line gear-handling equipment on the deck of the vessel were indicated during an earlier cruise of the Delaware in October-November 1964. For this cruise in April 1965, a redesigned long-line reel was constructed with a heavier frame, a larger core with increased length, a heavier automatic levelwind, an auxiliary hydraulic control near the reel, and an automatic braking device. After minor adjustments and a normal break-in period, the system functioned smoothly. An improved branch-line tub, designed to reduce snarls and ease branchline handling during setout, was given initial trials. Further separation of branchline coils and baited hooks in the tubs was indicated.

**OTHER ACCOMPLISHMENTS AND OBSERVATIONS:** With few exceptions, all viable tuna, marlin, and shark caught on long-line gear were marked with dart-type tags and released. In cooperation with the tagging program of the Woods Hole Oceanographic Institution, Woods Hole, Mass., 28 bluefin tuna, 16 yellowfin, 1 albacore, 1 big-eyed, and 2 white marlin were released. A total of 51 shark of assorted species was released for the Shark Research Panel of the American Institute of Biological Sciences. Stomachs and gonads from 40 tuna were frozen for analysis at the Bureau's Biological Laboratory, Washington, D. C. Night light-dip net collections were made at 2 stations and a single unproductive trolling transect at the end of one station was made when what appeared to be yellowfin tuna were observed breaking the surface. Five plankton tows were made, 3 during haulback of long-line sets, with an experimental surface net from the Woods Hole Oceanographic Institution which samples the top ten centimeters at the surface. Included in the catches were 3 larval swordfish taken at 3 stations.

Note: See Commercial Fisheries Review, February 1965 p. 31.



## North Atlantic Fisheries Investigations

### WINTER DISTRIBUTION AND ABUNDANCE OF GROUND FISH SPECIES STUDIED:

M/V "Albatross IV" Cruise 65-2; Part I (February 1-15, 1965), Part II (February 26-March 2): To determine the winter distribu-

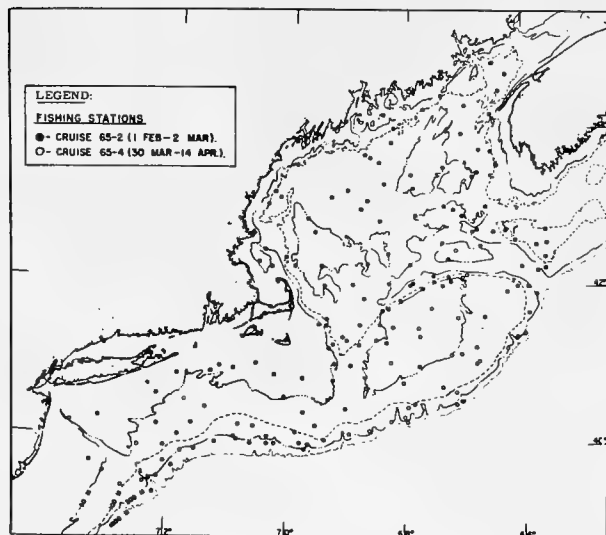


Fig. 1 - Shows fishing stations worked during M/V Albatross IV 1965 winter groundfish survey.

tion and relative abundance of groundfish species from the Bay of Fundy southward to Hudson Canyon was the objective of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Albatross IV. All survey stations were not occupied as planned because of difficulties encountered, but those from the Bay of Fundy southward (including Browns Bank) to the Northern Edge of Georges Bank were surveyed. The remaining stations were surveyed on a later cruise.



Fig. 2 - Fishing deck of M/V Albatross IV showing otter trawl and doors.

Ocean perch were caught in the deep waters off Cape Cod and at several locations in the Gulf of Maine; haddock were caught around Nova Scotia and on Georges Bank. A large catch of good marketable sizes of blackback flounder was taken off St. Mary's Bay, Nova Scotia. Moderate quantities of cod were caught on Stellwagen Bank and in the South Channel, and spiny dogfish were taken in the deep water off the Northern Edge of Georges Bank.

All fish caught during the cruise were identified and measured and the total weight by species was obtained for each tow. Stomach contents from a variety of species were examined and recorded, and scale samples were taken from yellowtail flounder and haddock. Otoliths were obtained from silver hake and white hake. A sample of the bottom type was obtained at each station. Invertebrates caught in each tow were preserved for study.

\* \* \* \* \*

M/V "Albatross IV" Cruise 65-4, Part I (March 30-April 8, 1965); Part II (April 8-14): The first phase of this cruise, which was conducted in two parts, was partly a continuation of the Bureau's research vessel Albatross IV Cruise 65-2 to survey the area from Hudson Canyon to the Northern Edge of Georges Bank.

Relatively few fish were caught on the southern part from Hudson Canyon to Georges Bank during the first phase of this cruise. One large catch of dogfish (12,000 pounds) was made in 88 fathoms off southern New England. On the western side of Nantucket, over 800 pounds of ocean pout were caught in shoal water, and on Georges Bank several good catches of haddock were made in the shoal water.

All fish caught on this cruise were identified and measured. The total weight by species was obtained for each tow, and stomach contents from a variety of species were examined and recorded. Scale samples were taken from yellowtail flounder and haddock. Otoliths were extracted from silver hake, red hake, and white hake. A sample of the bottom type was obtained at each station. Invertebrates caught in each tow were preserved for study and samples of sea herring were collected for laboratory studies.

During the cruise tows were made at several depths with the Isaacs-Kidd midwater

trawl in an area about 160 fathoms deep off the Northern Edge of Georges Bank. The gear was towed at 5 knots and probably did not exceed 70 fathoms in depth. Adult whiting (silver hake) and shrimp were caught in each tow.

Part II of this cruise was a continuation of an earlier special sampling cruise in January 1965, designed to determine effect of tow duration, speed, and distance trawled on size and variability of catches. Trawling was conducted in the same area (southeast part of Georges Bank) as previously, using the same 3-stage sample design, and the same gear (No. 36 trawl with liner in cod end--the "standard" census trawl).

Five stations were completed with 10 tows at each station (2 tows each lasting  $7\frac{1}{2}$ , 15, 30, 60, and 120 minutes). The catch (or aliquot sample) of each species was weighed and measured for each tow. Bathythermograph (BT) casts were made while steaming, and about every 6 hours while on station.

During this part of the cruise an odometer was attached to the foot rope of the trawl as on the January cruise, and number of turns recorded after each tow. At 2 stations and for a few tows at 2 other stations, a buoy with radar reflectors was anchored. Speed and distance trawled were determined by recording bearings and ranges of buoy during individual tows. Rough seas prevented extensive use of the buoys and 1 buoy was lost.

Out of 71 mature female haddock taken on the cruise and examined, 26 percent were not yet ripe, 30 percent were ripe or partly spent, and 44 percent were spent. It was believed that spawning may have been somewhat later than normal this year.

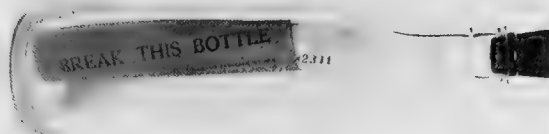
Note: See Commercial Fisheries Review, May 1965 p. 26; March 1965 p. 44.

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#### CONTINENTAL SHELF WATERS SURVEYED:

M/V "Albatross IV" Cruise 65-3 (March 9-22, 1965): To conduct an environmental survey of Continental Shelf waters in an area bounded by longitudes  $63^{\circ}$  W. and  $73^{\circ}$  W. was the purpose of this cruise by the research vessel Albatross IV. The survey included the collection of data on the vertical and horizontal distribution of temperature, salinity, oxygen, and chlorophyll.

A total of 87 hydrographic stations was occupied throughout the survey area and 157 bathythermograph (BT) lowerings were made



Type of drift bottle released at hydrographic stations.

to determine temperatures. Water samples were obtained at 11 different depths ranging from 1 to 250 meters (3.3 to 820 feet) to determine salinity, oxygen, and chlorophyll. During the cruise, 6 sea-bed drifters and 6 drift bottles were released at alternative hydrographic stations.

Note: See Commercial Fisheries Review, February 1965 p. 35.

\* \* \* \* \*

#### LOBSTER AND SEA HERRING POPULATIONS AND LARVAE STUDIED:

M/V "Albatross IV" Cruise 65-5 (April 21-30, 1965): Lobster and herring investigations were conducted during this cruise in the North Atlantic Ocean (general area of Georges Bank) by the research vessel Albatross IV. The objectives were to: (1) sample populations of lobsters and sea herring and obtain related environmental data, (2) obtain lobster and sea herring blood samples, and (3) make plankton tows for lobster and herring larvae.

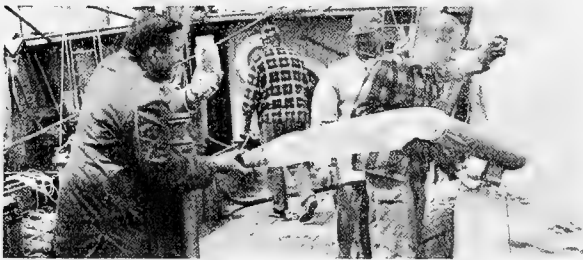
**FISHING OPERATIONS:** Lobster: A total of 24 trawl sets was made at the 10 lobster stations worked during this cruise. The sets made in waters ranging in depth from 58 to 170 fathoms yielded 272 lobsters, 140 females and 132 males. Thirty-two of the females were berried. Only one of all the lobsters caught (a female) was soft-shelled. The mean weight of the catch was 4 pounds, the range in weight was from 1 to 22 pounds. Morphometric measurements (17) were made on each of 200 lobsters, and 54 blood samples were obtained.

Herring: Six herring trawl sets were made at the 6 stations covered. The sets (1-hour duration) made in waters of 28 to 44 fathoms yielded a total of  $5\frac{1}{4}$  bushels of fish. The herring were caught primarily in the southwest and southeast part of the Banks, with only a few taken at 3 of the stations worked. The herring were from 12.0 to 32.5 centimeters (4.7 to 12.7 inches) long. The 1960 year-class was dominant in the catches, followed in percentage occurrence by sardine-size

herring (1962 and 1963 year-classes). A total of 50 herring blood samples were obtained and frozen in liquid nitrogen.

**PLANKTON OPERATIONS:** **Lobster:** Thirteen 1-meter net plankton tows, lasting 15 minutes each (at the surface) were made during the cruise.

**Herring:** A total of 26 1-meter net plankton tows each lasting 15 minutes (5 minutes each at depths of 32.5 feet and 4.7 feet, and 5 minutes at the surface) was made during the cruise. A total of 452 larvae with a mean length of 38 millimeters or 1.5 inches (range 27 to 52 millimeters or 1.1 to 2.0 inches) was obtained.



High-speed plankton sampler is hauled in and samples transferred to glass jar.

**HYDROGRAPHIC OBSERVATIONS:** During the cruise, 5 sea-bed drifters and 5 drift bottles were released at each of the plankton tow stations. At each station, bathythermograph (BT) casts were made; surface, mid-depth, and bottom salinity samples collected; and weather observations recorded. Surface and bottom temperatures were taken and recorded at lobster and herring stations worked.

The Albatross IV was scheduled to leave her home port at Woods Hole, Mass., on May 5 to conduct a survey of the sea scallop grounds on the eastern part of Georges Bank.

Note: See Commercial Fisheries Review, May 1965 pp. 25 and 26.

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#### SEA SCALLOP POPULATION SURVEY ON GEORGES BANK CONTINUED:

M/V "Albatross IV" Cruise 65-6 (May 3-13, 1965): To collect data on the distribution and abundance of sea scallops on the major scallop grounds of Georges Bank and to obtain samples of bottom invertebrates was the purpose of this 9-day cruise by the research vessel Albatross IV.



The U. S. Bureau of Commercial Fisheries research vessel Albatross IV.

A total of 194 tows was made at 192 stations with a 10-foot standard sea scallop dredge with a 2-inch ring bag. Hydrographic operations consisted of 212 bathythermograph (BT) casts made at each station worked and at hourly intervals while steaming to and from Georges Bank. About 100 live sea scallops were brought back for study at the Bureau's Biological Laboratory at Woods Hole, Mass.

Note: See Commercial Fisheries Review, December 1964 p. 51.

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#### BARNACLE LARVAE IN GULF OF MAINE AND RELATION TO SARDINE FEED:

Several biological research cruises to determine the abundance and distribution of barnacle larvae and other planktonic organisms along the Maine coast were conducted earlier this year by research vessels operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Boothbay Harbor, Me. This short article documents the results of those cruises and relate the findings to the type and amount of feed found in sardine stomachs during the period.

The first cruises with the Bureau's research vessel Phalarope II in the areas of Boothbay Harbor, Pemaquid and Tenants Harbor, showed that the waters were dominated by barnacle larvae in early stages of development. All plankton samples were between 75-90 percent barnacle larvae. The greatest abundance occurred in the bays and decreased in the offshore areas (2 miles out). The later cruises in those areas showed less difference between inshore and offshore waters and a reduction of barnacle larvae by nearly 50 percent. In addition, the larvae were in late

stages of development and were concentrated in depths between 2 to 15 fathoms. The greatest numbers occurred at a depth of 5 fathoms. Those results showed that the peak swarming in the western area had passed and that it should continue to subside.

Another cruise was made in early April 1965 by the research vessel Rorqual to compare the plankton in eastern and western waters. The samples from areas west of Penobscot Bay were dominated by barnacle larvae, most samples tallying 80 percent of that species. In the area of Isle au Haut, the total plankton volumes were much lower and only 10 percent were barnacle larvae. Samples from Passamaquoddy Bay and in the vicinity of the Wolves showed less than 2 percent barnacle larvae and red feed (copepods) dominated the samples. This information, together with records from past years, suggests that the swarming of barnacle larvae in eastern waters may not occur until May.

An examination of sardine stomachs corroborated the Bureau scientists' findings on the time of barnacle swarming. Fish taken near Pemaquid in early March contained no barnacle larvae and were generally free of feed. By late March, some of the samples of fish were 90 percent feedy with barnacle larvae, whereas other samples were entirely free of feed. Samples during the first two weeks in April also varied considerably, but in those fish that were feedy, barnacle larvae dominated the feed. Samples from eastern waters had no barnacle larvae and were generally less feedy.

As the sea water temperatures continue warming, other plankton organisms were expected to increase in number and to reach bloom stages. Feedy sardines can be expected to occur coincident with those blooms, although with warmer temperatures, the metabolic rate will increase and clearing time will be less than in the winter and early spring months.

Note: See Commercial Fisheries Review, May 1965 pp. 25 and 26.



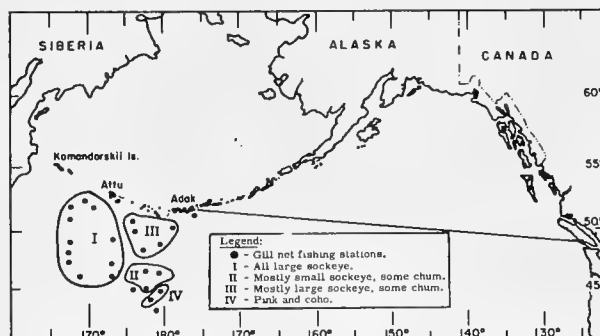
## North Pacific Fisheries Investigations

### WINTER 1965 SALMON RESEARCH CRUISE IN WESTERN NORTH PACIFIC BY RESEARCH VESSEL "GEORGE B. KELEZ":

A two-month salmon research cruise in the western North Pacific Ocean by the U. S. Bureau of Commercial Fisheries research ves-

sel George B. Kelez was completed on March 28, 1965. Earlier cruises by the Bureau's research vessel have shown large concentrations of immature salmon (primarily sockeye and chum) to be close to the south side of the Aleutian chain during summer. Results of the George B. Kelez fall 1964 cruise, however, indicated that the area of greatest abundance had shifted to the western Aleutian region. The winter 1965 cruise was designed to trace the salmon migration during winter by gill-net fishing in the same general area fished during the fall of 1964, according to the Bureau's Biological Laboratory, Seattle, Wash.

A total of 24 gill-net sets were made between Adak Island and the Kommandorski Islands, and south to 43° N. The total of about 1,300 fathoms of surface gill nets with mesh sizes ranging from 2 to 5½ inches (stretched measure), took 598 sockeye, chum, pink, and coho salmon. The northern and western portions of the area fished yielded mostly large and probably maturing sockeye salmon; a "band" of immature, 1-winter-at-sea, sockeye was found near 46.5° N., and pink and coho salmon (but no sockeye) were caught south of 45° N. Chum salmon were taken in small but consistent numbers throughout the eastern half of the cruise. The southern limit of winter salmon distribution in that area appears to be near 43° N., where only one chum salmon was collected (chart).



Shows fishing stations and catch composition during winter cruise of research vessel George B. Kelez.

Four experimental deep nets, which fished from the surface to a depth of 72 feet, were tried at several stations to investigate vertical salmon distribution. Only three salmon were taken deeper than 24 feet.

Note: See Commercial Fisheries Review, April 1965 p. 28; January 1965 p. 46.

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### SALMON MORTALITY AND GILL-NET DROPOUT STUDIES IN EASTERN ALEUTIAN AREA:

Three research vessels of the U. S. Bureau of Commercial Fisheries Biological Laboratory, Seattle, Wash., were scheduled to leave for the eastern Aleutian area in May 1965 where they were to conduct biological studies on salmon. The research vessels are the George B. Kelez, and the two chartered vessels Yaquina and the Paragon.

The primary objectives of the cruises are to: (1) study mortality of Bristol Bay salmon during their last 6 weeks of ocean life, and (2) determine the magnitude of salmon dropouts from high-seas gill nets.



Fig. 1 - Hull of M/V George B. Kelez. (Photo taken July 20, 1962, at dedication ceremonies, Seattle, Wash.)

**Natural Mortality Rates:** The effect of the extensive Japanese high-seas salmon fishery on the potential yield of the Bristol Bay stocks is unknown. Before reliable yield estimates can be obtained, adequate estimates of growth and natural mortality rates must be made available. Tagging is to be used as a direct method of estimating natural mortality rates. The George B. Kelez was to long line and gill net, and the Yaquina was to purse seine to provide fish for tagging purposes. Tagging operations were to start about June 5 south of Umnak Island in the Aleutian Chain, and were to terminate just outside the Bristol Bay fishery about July 5. Most salmon were to be tagged with Petersen disc tags, but some with the "spaghetti"-type tag in an attempt to measure gill-net selectivity for the disc tag. The assignment of a physiologist on board the George B. Kelez was to attempt to assess tag-



Fig. 2 - Salmon being tagged on the high seas to obtain information on growth rates, mortality, and migration during ocean life.

ging mortality and apply holding oxygen treatments as possible means of reducing such mortality.

**Gill Net Dropouts:** In a concurrent study the vessels Paragon and the Kelez were to fish special strings of gill nets to determine salmon dropout rates (salmon caught in gill nets, but not landed). It is not known what percentage of salmon escape from high-seas gill nets, or what percentage of salmon that escape from nets may perish before reaching the inshore fishery or the spawning streams. The gill nets were to be fished for varying periods of time throughout the night and the catches compared for nets fished for long periods versus the cumulative catch of nets fished during shorter time intervals. The gill nets fished for the dropout study were to also provide some fish for tagging.



### Oceanography

#### NEW ORGANIZATION WORKS TO DEVELOP SOUTHERN NEW ENGLAND AS A MARINE RESEARCH CENTER:

A group seeking to further develop southern New England as a national center for marine research has formed the Southern New England Marine Sciences Association (SNEMSA). The new organization was announced May 25, 1965, by the president of the University of Rhode Island. He said SNEMSA could help bring ocean-oriented industries and research groups to the area and also strengthen exist-



ing firms. "The result," he added, "would be more jobs and a healthier economy."

Explaining the need for the new organization he said, "Most of the ingredients for a strong scientific complex--marine-based industries, federal research laboratories, and graduate programs in oceanography and engineering--are already here, but we have lacked a rallying point and a focal point for leadership which, I believe, this organization can provide."

One of the first projects of SNEMSA will be an economic inventory of the people, facilities, and other resources within southern New England. The inventory will be made by the chairman of the University of Rhode Island Department of Food and Resources Economics. He expressed enthusiasm for the project "because the area under consideration has many characteristics of an economic region that we can study and hopefully assist with some imaginative planning."

The economist pointed out that "the area has a historic association with the sea, its occupations, and its problems. It is confined in terms of natural resources to those created by the meeting of the sea with the land; that is to say: bays, harbors, fishable waters, beaches, and landscapes characterized by the sea and its climate."

The dean of the University of Rhode Island Graduate School of Oceanography was elected chairman of SNEMSA at a meeting attended by some 25 individuals from seaboard organizations in Connecticut and Rhode Island. The membership includes marine scientists, businessmen, fisheries men, and administrators. Membership is on an "individual" rather than an "organizational" basis.

The objectives of SNEMSA are to: (1) foster the development of the marine sciences in southern New England; (2) develop a system of internal communication to summarize technical and general information available within the group; (3) develop a system of external communication with the public; (4) develop a system of Government liaison; and (5) provide an intellectual climate that would serve to attract scientific and technical personnel to the area. (University of Rhode Island, Kingston, R. I., May 25, 1965.)

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#### EDUCATIONAL GRANTS FOR 1965 AWARDED BY INTERIOR DEPARTMENT:

Graduate educational grants in oceanography have been awarded by the U. S. Department of the Interior to 18 universities as part of the National Oceanographic Program, announced Interior's Secretary Stewart L. Udall, May 17, 1965. The awards will be available for the 1965 fall semester to outstanding and deserving student scientists, who have or are about to be graduated, selected by the universities to receive one- or two-year grants.

The 1965 grants are for studies in economics, fishery technology, taxonomy (science of classification), physical and chemical oceanography, marine biology, fishery biology, ocean engineering, and biological oceanography. A total of 42 student years will be awarded, 5 years of which may be used at the discretion of the institutions to extend the grants of 5 students already participating in the program.

Grants provide for payment of tuition fees plus a living expense allowance of \$3,000 annually. Married students with children receive an additional \$1,000 family allowance. Students at the University of Alaska's Institute of Marine Science receive an additional 25 percent of each allowance, if both are applicable, because of the higher cost of living in Alaska.

Secretary Udall said the program was started in 1962 to assist in developing scientists in oceanographic subjects related to fisheries. The program is administered by Interior's Bureau of Commercial Fisheries which makes \$200,000 available annually for the study program. Universities receiving the grants are selected by the Department of the Interior with the advice of a panel of outstanding scientists. All qualified institutions are invited to participate in the program. Grants were made to 12 universities in 1962 and to 17 in 1963 and 1964.

Students' applications for grants are submitted directly to the university of their choice. The actual number of participating students is contingent upon decisions by the universities in awarding one- or two-year grants.

Universities receiving the 1965 grants and the various fields of study are: University of Florida, economics; University of Massachu-

setts, economics and fishery technology; Oregon State University, ocean engineering, biological oceanography and fishery technology; University of Alaska (Institute of Marine Science), chemical oceanography; University of Washington, fishery technology and physical oceanography; Scripps Institution of Oceanography, physical and/or biological oceanography; The Johns Hopkins University, physical oceanography; Rutgers University, fishery technology; University of Miami (Institute of Marine Science), fishery biology and physical oceanography; University of Michigan, fishery biology; Cornell University, fishery biology; University of Rhode Island, biological oceanography; Harvard University, marine biology and ecology or biological oceanography; Duke University, marine biology and ecology; University of Hawaii, marine biology and ecology; Michigan State University (W. K. Kellogg Biological Station), limnology (study of lakes and their contents); University of Texas, taxonomy or fishery biology; University of Georgia, marine biology and ecology or fishery biology.

Note: See Commercial Fisheries Review, May 1964 p. 28.

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#### FOURTH EXPEDITION TO GULF OF GUINEA COMPLETED BY RESEARCH VESSEL "GERONIMO":

After completing a 4-month 15,000-mile expedition to the Gulf of Guinea off West Africa, the oceanographic research vessel Geronimo, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Washington, D. C., returned to her home base at the Navy Yard Annex on May 18, 1965.

This fourth cruise of the research vessel Geronimo to West Africa during the International Cooperation Year, now being observed worldwide, was another contribution to United States participation in cooperative international studies of the tropical Atlantic Ocean. Those studies were begun in 1963 and have involved some 20 oceanographic research vessels from many nations. One of the major goals is to gain knowledge useful in increasing the supply of protein for West African countries. The Geronimo's Chief Scientist on the cruise said the vessel's latest expedition was successful in accomplishing two main objectives: (1) further measurement of a heretofore unknown ocean current in the Gulf of Guinea, and (2) confirmation of hypotheses about the distribution of tuna schools off West Africa.

During the first cruise of the vessel Geronimo to the Gulf of Guinea in 1963, the odd behavior of research instruments in the water below the eastward-flowing Guinea Current led scientists to believe that a substantial westward-flowing undercurrent existed. On subsequent cruises, the formerly unknown Guinea Undercurrent was confirmed, and the measurement of its role in the Gulf of Guinea circulation has been accomplished.



Scientists and crew aboard the Geronimo are preparing to open the cod end of a large trawl to study the organisms captured.

The wide-ranging tuna are found where their food is most abundant--generally near the boundary between ocean water of differing types and origin. In February 1965 such a boundary was found offshore from Senegal to Sierra Leone, West Africa, by scientists aboard the Geronimo. As predicted, great concentrations of tuna schools were located just to the south of that boundary.

A new oceanographic instrument, developed at the University of Miami, was tested from the Geronimo on this latest cruise. When lowered into the water, it records aboard ship simultaneously and continuously the depth, temperature, salinity, and time. Its use will greatly increase the speed and efficiency of data collection on future oceanographic surveys.

While on this expedition, the vessel Geronimo rendezvoused with the John E. Pillsbury, the fishery and oceanographic research vessel of the Institute of Marine Science, University of Miami. Particular concern of the joint research was a study of variations in rate of flow of the Atlantic Equatorial Under-

current and changes in its north-south location.

The latest cruise of the vessel Geronimo also had other international aspects. Two French scientists of the ORSTOM Laboratory at Pointe-Noire, Republic of Congo (Brazzaville), worked aboard the Geronimo during the tuna surveys. They are studying the population dynamics of tuna off West Africa. At Monrovia, Liberia, about 20 biology students from the University of Liberia were shown the vessel's laboratories and its oceanographic equipment. Also, during a tuna survey in waters off the Republic of Ivory Coast, a one-day cruise was arranged for fishery administrators and fishery scientists, and fish processors of that nation to demonstrate various oceanographic techniques.

Note: See Commercial Fisheries Review, January 1965 p. 43.

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#### RESEARCH VESSEL "JOHN ELLIOTT PILLSBURY" STARTS LONG OCEANOGRAPHIC EXPEDITION:

A 23,00-mile oceanographic expedition to the Caribbean, South America, Africa, and the Mediterranean was started in March 1965 by the oceanographic research vessel John Elliott Pillsbury. The 176-foot vessel is operated by the Institute of Marine Science (IMS), University of Miami, and will be at sea about 9 months.

The vessel's itinerary and research activities on the expedition include studies of productivity and the chemistry of sea water in the Guiana basin and at the mouth of the Amazon River. Following those studies, she will cross the Atlantic at the equator, investigating surface and subsurface currents enroute. On this lap of the cruise, the IMS oceanographers aboard the vessel will take part in Equalant V, an international survey of the tropical Atlantic in which scientists from 11 nations are participating. During an earlier phase of Equalant, the IMS vessel discovered an immense undersea mountain, or seamount, in that part of the Atlantic. The peak has been named Pillsbury Seamount. During Equalant V, the Institute's vessel will cooperate closely with the U. S. Bureau of Commercial Fisheries research vessel Geronimo. The Bureau's research vessel will operate out of Miami after the new U. S. Fish and Wildlife laboratory has been completed.

Along the west coast of Africa the Institute's Division of Biological Sciences will

conduct an investigation of the southern part of the Gulf of Guinea, collecting fish and invertebrates from surface waters, mid-depths, and from the deep-sea floor.

Following the Gulf of Guinea studies, the John Elliott Pillsbury will then proceed north to the Straits of Gibraltar and enter the Mediterranean Sea. While in that area, a geological, geophysical, and geochemical investigation of the Mediterranean Sea and the Black Sea will be conducted for about 5½ months. Submarine volcanoes will be investigated, and studies of deep-sea sediments, currents, and bottom topography will be carried out. In the Black Sea, sometimes known as the "Kingdom of the Dead," piston-coring devices and bottom dredges will be used to sample the poisonous depths. In that body of water, there are no living organisms of any kind (except for a few bacteria) below the surface layers, and no oxygen, and consequently the bodies of surface animals that sink to the depths do not decompose in the usual manner. In the Black Sea, the vessel scientists hope to find bodies of ancient forms still intact on the bottom. There, also, are possibly ideal conditions for the formation of petroleum--about which very little is known to science.

The Institute's research vessel John Elliott Pillsbury was commissioned in July 1963, and since then has logged more than 330 days and over 50,000 miles at sea on expeditions and cruises for the Miami Institute of Marine Science. The vessel carries a crew of 22 and a scientific party of about 14. (News of Institute of Marine Science, Miami, Fla., March 5, 1965.)

Note: See Commercial Fisheries Review, September 1964 p. 34.

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#### RESEARCH VESSEL "EASTWARD" DEDICATED BY DUKE UNIVERSITY:

The \$1.2 million research vessel Eastward was dedicated May 1, 1965, at Beaufort, N.C., by Duke University. Built under a grant from the National Science Foundation, the 117.5-foot vessel will be used by Duke University for oceanographic research in marine biology.

Speaking at the dedication ceremony, Dr. Paul M. Gross of Duke University said man must turn to the limitless resources of the sea to feed his rapidly growing numbers. Recent scientific discoveries indicate there is "enough food reserve in the ocean to take care of any imaginable population if scientists can only tap it," he said.



Fig. 1 - Duke University president officially accepts the Eastward from the National Science Foundation.

Dr. Gross also noted that the Eastward will allow scientists to study in detail the marine life and conditions off the Carolina coast. The knowledge thus gained could have important implications for the economy of the area.

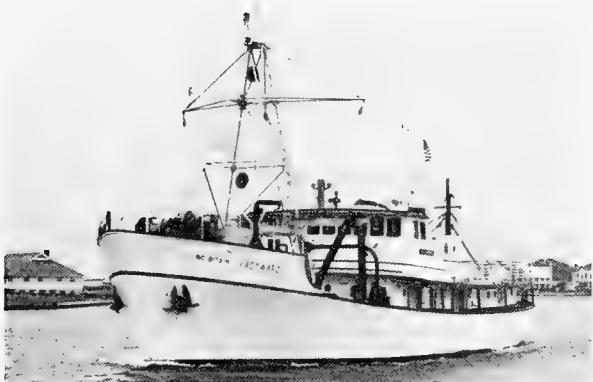


Fig. 2 - Oceanographic vessel Eastward sails from the dock of the Duke Marine Laboratory in Beaufort, N. C.

At a luncheon preceding the dedication, Congressman David Henderson said the method of the "old-time coastal fisherman is as outmoded as a one-mule farmer's operation." He pointed out that "the only way the present day farmer of the sea can keep pace with this technological age is by having available to him knowledge gained by the same kind of research which has enabled today's farmer of the soil to share so bountifully in the general national prosperity."

Home port for the Eastward will be Beaufort, N.C., where the Duke Marine Laboratory is located. (Office of Information Services, Duke University, Durham, N.C.)



## Oregon

### GOOD DOWNSTREAM PASSAGE REPORTED FOR CHINOOK SALMON YEARLINGS RELEASED DURING FLOOD EMERGENCY:

Apparently, many of the 2.2 million spring chinook salmon yearlings released prematurely last winter into the Middle Willamette River were able to pass downstream to the sea. Floods forced the emergency release above Lookout Point Dam and Dexter Dam of the yearlings from the Willamette Hatchery of the Oregon Fish Commission. (The fish were intended for release below the dams in the spring of 1965.)

Since neither dam has provisions for passage of fish, either downstream or upstream, it had been feared that most of the 2.2 million yearlings--a major part of the Willamette hatchery's 3.5 million spring chinook production--would be trapped in the reservoirs behind the dams. But water ran over the spillways at both Lookout Point and Dexter for more than a month during and following the flood. That apparently made it possible for most of the young fish to pass downstream.

While many of the fish appear to have escaped, the Oregon Fish Commission estimates that several hundred thousand of the young spring chinook could be landlocked in the reservoirs. To give those trapped fish an opportunity to escape, the U. S. Army Corps of Engineers agreed informally to spill water over the dams on a daily schedule in the spring of 1965 if the reservoirs fill.

The 1967 and 1968 spring chinook runs will include survivors of the emergency release returning as 4- and 5-year-old spawners. During the past 4 seasons, an average of 12 percent of the chinook passing up the ladder at Willamette Falls have eventually entered the holding ponds at Dexter, indicating the important role the Middle Willamette hatchery is playing in helping to maintain the valuable Willamette spring chinook run. (Oregon Fish Commission, May 10, 1965.)

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**STEELHEAD STOCKING PROGRAM:**

An expanded steelhead stocking program in certain of Oregon's streams has been announced by the Oregon Fish Commission. Some 328,000 juvenile steelhead trout from 3 Oregon hatcheries were released during late April 1965 into 4 river systems of Oregon.

When released, most of the young steelhead averaged 8 to 9 inches in length and weighed 7 or 8 to the pound--an optimum size, according to the Oregon Fish Commission. Experience has shown that steelhead of that size will make a rapid migration to the sea in the spring of the year, thereby arriving at the ocean with less mortality and in a shorter time than smaller fish. Steelhead with such a strong start should produce good returns of adult fish.

The April 1965 steelhead plant included 73,000 in the North Fork of the Klaskanine River, 55,000 in Big Creek, 156,000 in the North Santiam River, and 44,000 in the South Fork of the Yamhill River. (Oregon Fish Commission, May 7, 1965.)

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**DUNGENESS CRABS MARKED WITH "SPAGHETTI" TAGS:**

On the Pacific coast, some 4,000 Dungeness crabs were marked with "spaghetti" tags in the spring of 1965 by the Oregon Fish Commission. Each tag consists of red plastic tubing about 12 inches long and  $\frac{1}{16}$  inch in diameter. The tag bears a number and a legend requesting that capture of the crab be reported to the Oregon Fish Commission. Information on the location and date of capture as well as the tag number should be noted in reporting marked crabs.

The Dungeness crabs were tagged by sewing the "spaghetti" tag through paired holes punched in the shell at the splitting line (along which the shell separates during the molt). With this method of attachment, the tag is retained when the crab sheds its shell during molting. Records of the Oregon Fish Commission show that tags have been retained through at least three successive molts. (Oregon Fish Commission, May 10, 1965.)

Note: See Commercial Fisheries Review, May 1962 p. 25.

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**CLAM SPECIES ESPECIALLY SUITED TO BAYS AND ESTUARIES INTRODUCED ON TEST BASIS:**

The possibility of introducing another species of clam into Oregon tidal waters is being evaluated by the Oregon Fish Commission.

The species being considered is the Japanese littleneck clam. Accidentally introduced into Washington State waters some years ago, apparently with a shipment of seed oysters from Japan, the "foreign" littleneck found environmental conditions to its liking and soon became an important commercial and personal use species in the Puget Sound area.

Oregon now has a native littleneck clam which occurs in rocky areas along the coast but, with few exceptions, the native variety is killed readily by exposure to fresh-water dilution of its normal salty environment. By contrast, an outstanding biological characteristic of the Japanese littleneck is its ability to tolerate fresh water. This should make it adaptable to many Oregon bays and estuaries which are subject to heavy runoff from streams during flood periods. Japanese littlenecks show a preference for rocky or gravel-mud bottoms, a type of site not generally favored by species already present in the State.

With the cooperation of the Washington State Department of Fisheries, several thousand Japanese littlenecks of various size were obtained for experimental introduction into Oregon. Some of those clams were planted in an experimental area in Yaquina Bay. Others were placed at selected spots in Tillamook and Netarts Bays. Studies will be conducted over a period of time to learn whether the new species will do well under Oregon conditions as expected. A favorable outcome could mean good news to hundreds of Oregonians who reap a harvest of fun and profit from the State's tidelands. (Oregon Fish Commission, April 29, 1965.)

**Oysters****ANNUAL CONVENTION OF OYSTER INSTITUTE OF NORTH AMERICA:**

The annual meeting of the Oyster Institute of North America was held June 27-July 1, 1965, in Baltimore, Md. It was the 57th an-

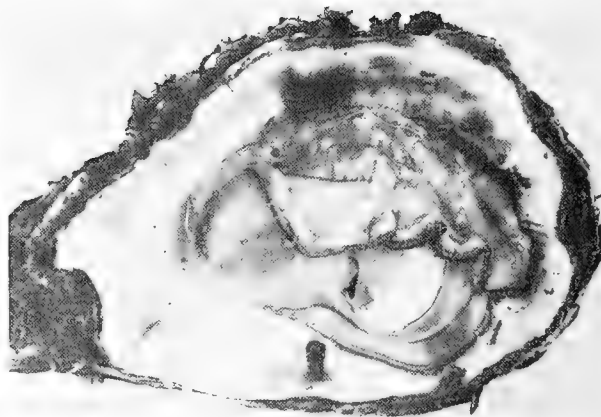
nual Oyster Convention--a joint meeting of industry's Oyster Growers and Dealers Association of North America and the technical people who are members of the National Shellfisheries Association. Represented at the annual meetings were producers, processors, distributors, and other related industry people, as well as researchers from Federal and State government agencies.

A joint session was held on hatchery and pond techniques for the pond and nursery technology of oyster and clam seed. Besides a number of outstanding speakers, there were many other prominent contributors to the knowledge of shellfish culture.

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#### NEW PARASITE DISEASE UNDER STUDY:

A disease of oyster gill tissue is under study at the U. S. Bureau of Commercial Fisheries Biological Laboratory in Oxford, Md. The disease is caused by a micro-parasite which has been tentatively placed in the genus *Sphenophrya*. The organism is a ciliate found in large cysts on the gill surface of diseased oysters. Study of the parasite includes efforts to culture it in a wide variety of media and under a number of experimental conditions.



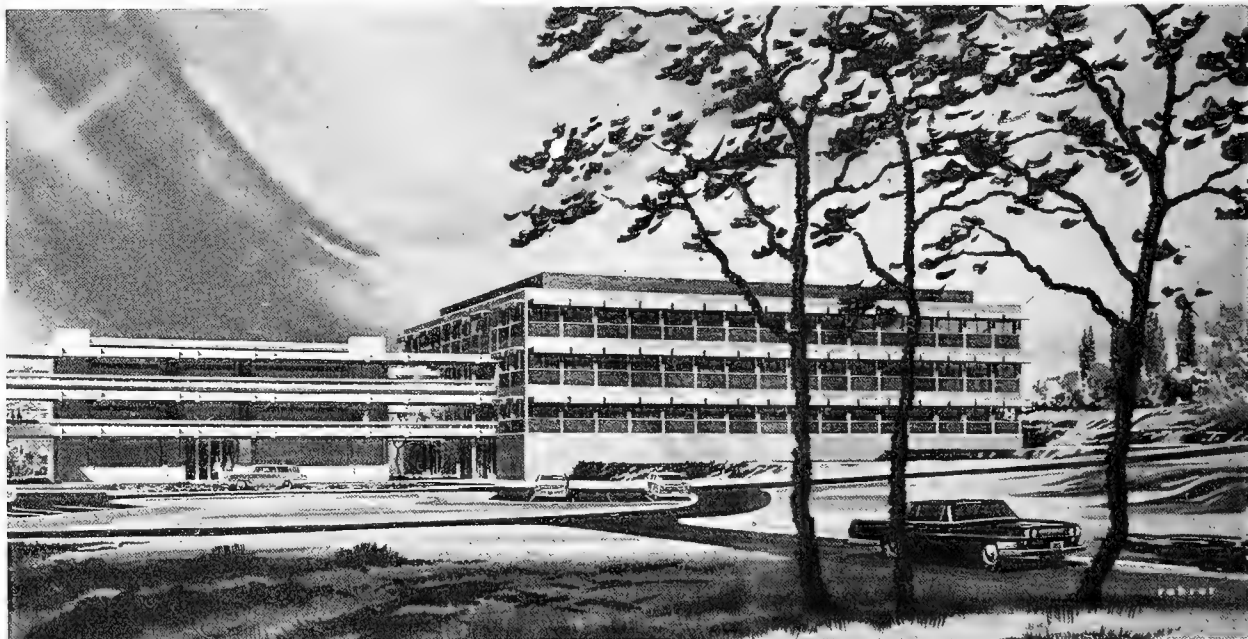
Pathological evidence of a microparasite on oyster gill tissue. Note large encysted bodies on gill surfaces and within tissue matrix. Microscopic examination of cyst contents revealed numerous ciliates to be present.



#### Pacific Northwest

##### NEW U. S. BUREAU OF COMMERCIAL FISHERIES RESEARCH LABORATORY IN SEATTLE:

The U. S. Bureau of Commercial Fisheries dedicated its new Fishery Research Laboratory in Seattle, Wash., April 19, 1965. "This facility, with all the latest scientific equipment, marks the beginning of a new era in



Artist's sketch of the new Seattle Fishery Research Laboratory dedicated April 19, 1965.



biological and technological research," said Samuel J. Hutchinson, the Bureau's Regional Director for the Pacific Northwest. The new 4-story laboratory contains 65,000 square feet of floor space and will provide accommodations for 100 scientists and their support personnel.

Among projects to be conducted in the new building are research on the promising new hake industry in the Northwest and new uses for fish oil.

A feature of the new building is a water temperature control system which permits biologists to study the effect of temperatures on survival of salmon eggs, fry, and fingerlings. Such information is needed to improve hatcheries.

Speaking at the dedication, Regional Director Hutchinson reviewed the growth of North Pacific fisheries research programs. These include studies of salmon, herring, and crab; chemical research to find improved uses for fish and marine products; and exploratory fishing and gear research. The growing importance of those programs created the need for the new laboratory.

Senator Warren G. Magnuson gave the main address at the dedication of the new laboratory. He emphasized the problems arising out of foreign fishing in the North Pacific. In his opening remarks, Senator Magnuson said "But I wish to emphasize to you today that the dedication of this building is more than a dedication of a proud structure. It is a dedication and renewed effort to properly manage, conserve, and develop our fisheries in the North Pacific. It is a dedication to protect, by what-

ever means necessary, these resources which have been passed to us and which we resolve to conserve for our future generations."



## Salmon

### U. S. PACIFIC COAST CANNED STOCKS, MAY 1, 1965:

On May 1, 1965, canners' stocks in the United States of Pacific canned salmon totaled 1,150,880 standard cases (48 1-lb. cans), 284,865 cases less than on April 1, 1965, when stocks were 530,442 cases less than on March 1, 1965.

On the basis of a total of 1,383,060 actual cases (consisting of cans of  $\frac{1}{4}$ -lb.,  $\frac{1}{2}$ -lb., 1-lb., etc.), pink salmon accounted for 47.3 percent (654,421 cases of which 519,443 cases were 1-lb. talls) of the total canners' stocks on May 1, 1965. Next came chum (373,892 cases, mostly 1-lb. talls), followed by red (227,847 cases). The remainder of about 9.2 percent was coho (silver) and king salmon. Pink salmon stocks on hand packed in 48 1-lb. cans accounted for 79.4 percent of the to-

Species	May 1, 1965	Apr. 1, 1965	Mar. 1, 1965
	.....(No. of Actual Cases).....		
King.....	39,645	46,882	63,915
Red.....	227,847	299,277	411,505
Coho.....	87,255	102,233	128,589
Pink.....	654,421	849,663	1,201,716
Chum.....	373,892	428,803	536,529
Total...	1,383,060	1,726,858	2,342,254

Table 2 - Total Canners' Stocks on Hand May 1, 1965 (Sold and Unsold), By Species and Can Size

Case & Can Size	King	Red	Coho	Pink	Chum	Total
	.....(Actual Cases).....					
48 $\frac{1}{4}$ -lb. ....	3,995	57,005	20,244	2,464	122	83,830
48 $\frac{1}{2}$ -lb. ....	31,212	118,901	16,947	125,557	45,997	338,614
48 1-lb. ....	4,335	51,883	46,771	519,443	315,530	937,962
12 4-lb. ....	103	58	3,293	6,957	12,243	22,654
Total.....	39,645	227,847	87,255	654,421	373,892	1,383,060

Table 3 - Canners' Shipments from July 1, 1964, to May 1, 1965, By Species and Can Size

Case & Can Size	King	Red	Coho	Pink	Chum	Total
	.....(Actual Cases).....					
48 $\frac{1}{4}$ -lb. ....	20,252	370,927	102,448	9,217	1,322	504,166
48 $\frac{1}{2}$ -lb. ....	105,630	568,193	37,428	477,911	112,094	1,301,256
48 1-lb. ....	17,786	446,171	121,738	1,878,481	563,077	3,027,253
12 4-lb. ....	313	4,892	18,197	92,440	27,299	143,141
Total.....	143,981	1,390,183	279,811	2,458,049	703,792	4,975,816

tal pink salmon stocks as of May 1, 1965, with the balance mostly in 48  $\frac{1}{2}$ -lb. cans.

From April 1 to May 1, 1965, pink salmon stocks were lower by 195,242 actual cases (1-lb. talls lower by 157,119 cases), reds were down 71,430 cases, and chums were down 54,911 cases.

Carryover stocks at the canners' level totaled 1,175,588 standard cases on July 1, 1964, the approximate opening date of the Pacific salmon packing season. Adding the new season pack of 3,922,356 standard cases brought the total available supply for the 1964/65 season to 5,097,944 standard cases.

Shipments at the canners' level from July 1, 1964, to May 1, 1965, totaled 4,975,816 actual cases (equal to 3,947,064 standard cases).

Data on canned salmon stocks are based on reports from U. S. Pacific Coast canners who packed over 97 percent of the 1964 salmon pack. (Division of Statistics and Economics, National Canners Association, May 26, 1965.)



## Shrimp

### GULF AND SOUTH ATLANTIC LANDINGS, 1964:

United States commercial shrimp landings (heads-off weight) in the Gulf and South Atlantic States during 1964 totaled 124.3 million

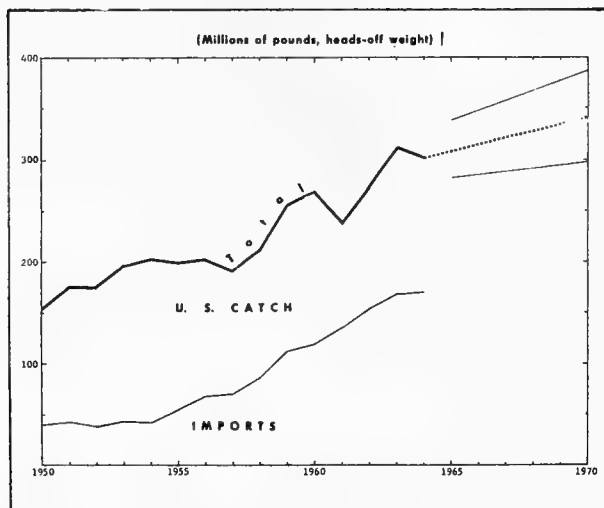


Fig. 1 - U. S. shrimp supply, 1950-1964 with forecast to 1970.

pounds with an ex-vessel value of \$69.3 million--a decrease of 10 percent in quantity, but an increase of 1 percent in value from 1963. Landings in the southern States made up over 90 percent of the total 1964 U. S. shrimp catch.



Fig. 2 - Shrimp trawlers at the dock in a Mississippi port.

In 1964, Texas led all other southern States with total shrimp landings of 41.6 million pounds, followed by Louisiana with 38.1 million pounds, and the Florida West Coast with 25.0 million pounds. The remaining 19.6 million pounds was landed in ports of Mississippi, Alabama, the Florida east coast, Georgia, South Carolina, and North Carolina.



Fig. 3 - Conveyor used to unload shrimp from vessels at Aransas Pass, Tex.

Brown shrimp was the leading species landed in Texas, while white shrimp predominated at Louisiana ports, and pink shrimp made up the bulk of the Florida west coast landings.

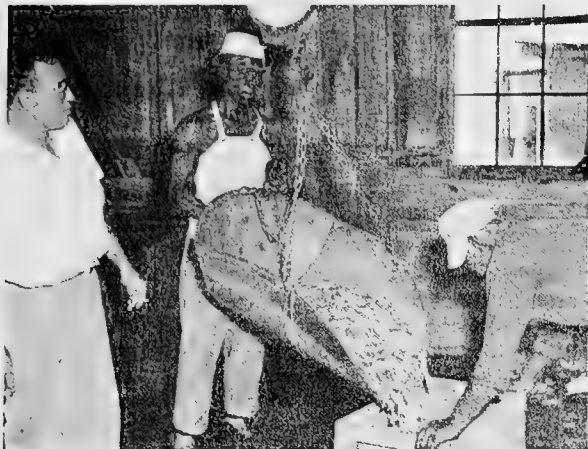


Fig. 4 - Weighing fresh heads-off shrimp in a Florida plant.

A breakdown, by major fishing areas, of the 1964 Gulf catch (excluding the Atlantic areas), shows 12.4 million pounds were taken from Sanibel and Tortugas; 3.2 million pounds from the Apalachicola area; 11.5 million pounds from Pensacola to the Mississippi River; 37.8 million pounds from the Mississippi River to Texas; 29.6 million pounds from the Texas coast; 5.2 million pounds from the high seas off the Mexican Coast west of 94° W. longitude; 12.2 million pounds from the high seas off Obregon and Campeche; and 1.3 million pounds from the Caribbean Sea south of 21° N. latitude. A large part of the Gulf catch was taken in depths of under 20 fathoms, and (with the exception of royal-red shrimp) almost all of the catch was taken under 45 fathoms.

(Note: Gulf catch data for 1964 are not comparable with landings data shown above because in the Gulf data: (1) South Atlantic catches are not included, and (2) catch data include trips completed during the year, regardless of when landings occurred.)



## South Atlantic Fisheries

### Explorations and Gear Development

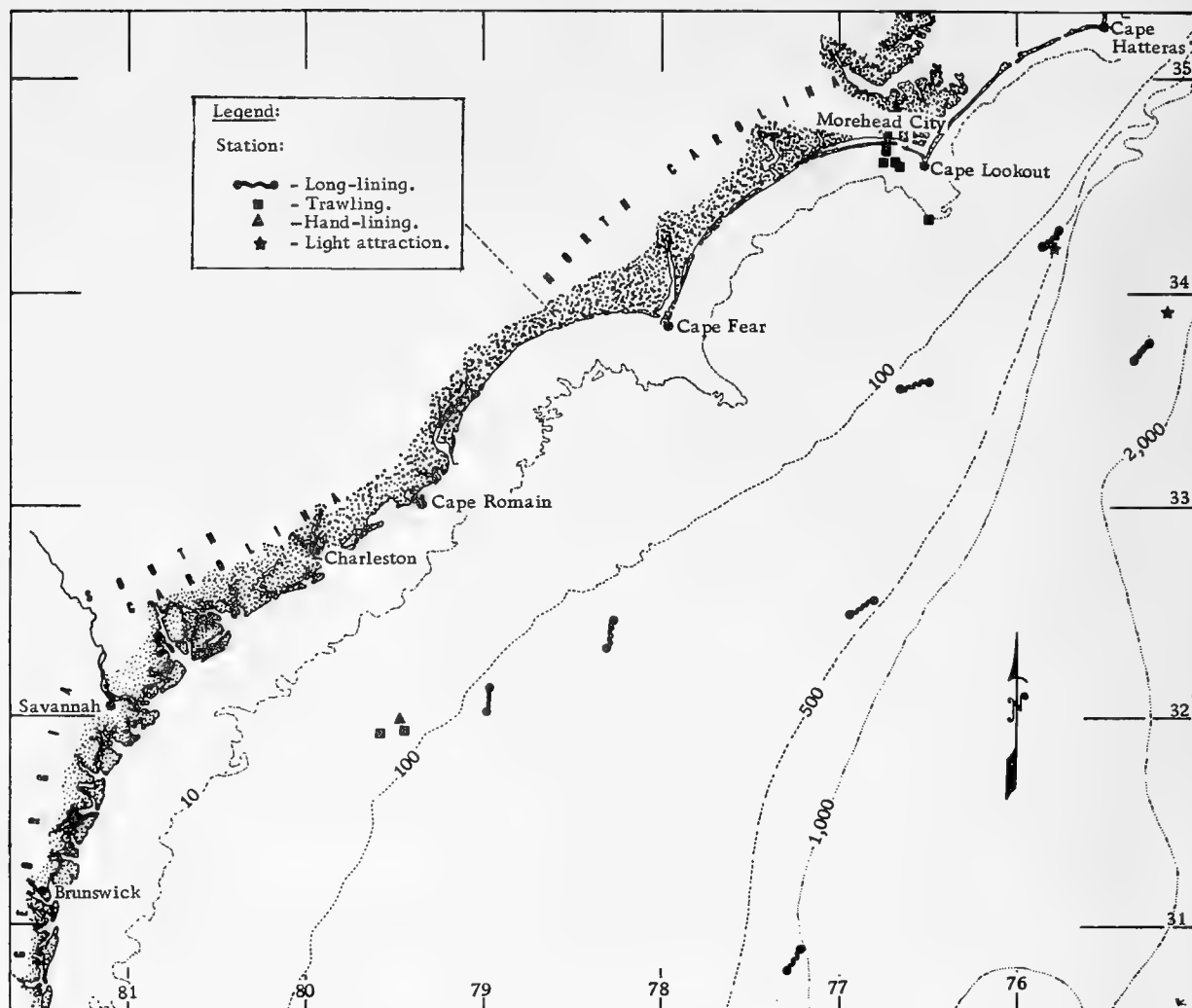
#### COMMERCIAL AVAILABILITY OF SWORDFISH AND TUNA TO LONG-LINE GEAR INVESTIGATED:

M/V "Oregon" Cruise 100 (March 29-April 16, 1965): To assess stocks of pelagic fish and their availability to commercial long-line fishing gear in waters of the Florida and Antilles Current was the objective of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon.

High winds and heavy seas during the 19-day cruise limited the number of exploratory long-line sets to 7. Five 50-basket (500 hooks) night sets, one 40-basket (400 hooks) night set, and one 30-basket (300 hooks) daylight set were made. The long-line gear and methods used were the same as those used on two cruises conducted during 1964. Buoy drop-pers were varied in length from 5 to 100 fathoms. About 75 percent of the gear was fished with 5-, 10-, 20-, and 30-fathom droppers. The remainder was fished with 50-, 75-, and 100-fathom drop lines. Bait used included spot (Leiostomus), croaker (Micropogon), butterfish (Poronotus), goatfish (Mullus), weakfish (Cynoscion), false albacore (Euthynnus alletteratus) strips, and squid.

A total of 7 swordfish (Xiphias gladius), 2 big-eyed tuna (Thunnus obesus), 1 skipjack (Katsuwonus pelamis), 7 blackfin tuna (T. atlanticus), and 98 sharks of 6 different species were caught. The swordfish were taken at 5 of the 7 widely scattered locations and depths sampled during the cruise. Three swordfish were caught at a station in 190 fathoms east of Frying Pan Shoal, and 4 swordfish were caught at 4 different localities with depths varying from 165 to 1,800 fathoms. Baskets with 10-fathom buoy droppers yielded 4 swordfish, those with 20-fathom droppers accounted for 2, and those with 50-fathom droppers yielded 1 swordfish. Two big-eyed tuna were caught on 20-fathom droplines over 1,800 fathoms east of Cape Lookout. One skipjack tuna was caught from a large school that had surfaced around the vessel during retrieval of the long line at one of the stations.

Large numbers of sharks were again encountered as in previous cruises to the area investigated at the edge of the Continental Shelf. They were a detriment to fishing oper-



Station pattern of M/V Oregon Cruise 100 (March 29-April 16, 1965).

tions and caused gear fouling resulting in mutilated fish. A total of 28 sharks, mostly silky (*Carcharhinus falciformis*), were taken in 165 fathoms at one station. At the station off Cape Lookout, an unexpected northwest drift moved the long-line set from 500 fathoms to 40 fathoms where 51 sharks, mostly silky and scalloped hammerhead (*Sphyrna lewini*), were taken. Very few sharks were encountered beyond the 200-fathom curve. A breakdown of the 98 sharks taken during the cruise is: 51 silky, 28 hammerhead, 10 night (*Hypoprion signatus*), 5 blue (*Prionace glauca*), 2 mako (*Isurus oxyrinchus*), and 2 whitetip sharks (*Carcharhinus longimanus*). Of those, 31 were tagged and released.

Bathythermograph (BT) casts were made at each long-line station occupied by the ves-

sel. Thermocline depths and temperatures varied widely over the area surveyed. No correlations could be made with the data regarding the relation between swordfish occurrence and the temperatures and depths of the water masses. Two light-attraction and 7 nekton ring-net stations were occupied to sample macroplankton in the area.

During the cruise, 7 trawl hauls in shallow water were made off Savannah, Ga., and Morehead City, N.C., for obtaining bait. Flatfish and puffers dominated the catch in those two areas.

Trolling with bone and lead-head feather jigs yielded 52 false albacore averaging  $6\frac{1}{2}$  pounds each. An electronic trolling alarm system was successfully installed aboard the

vessel and tested throughout most of the cruise.

Note: See *Commercial Fisheries Review*, March 1965 p. 50; January 1965 p. 47.



## Tuna

### 1965 ALBACORE AND BLUEFIN TUNA CATCH FORECAST FOR UNITED STATES PACIFIC COASTAL AREA:

A report on the annual prediction for the expected tuna catch during 1965 in the temperate tuna fishery off the Pacific Coast was issued in May 1965 by the staff of the Tuna Forecasting Program, U. S. Bureau of Commercial Fisheries Biological Laboratory, La Jolla, Calif. It is the fifth in a series of annual predictions and includes additional data incorporated into the prediction system, with the addition of refinements where appropriate.

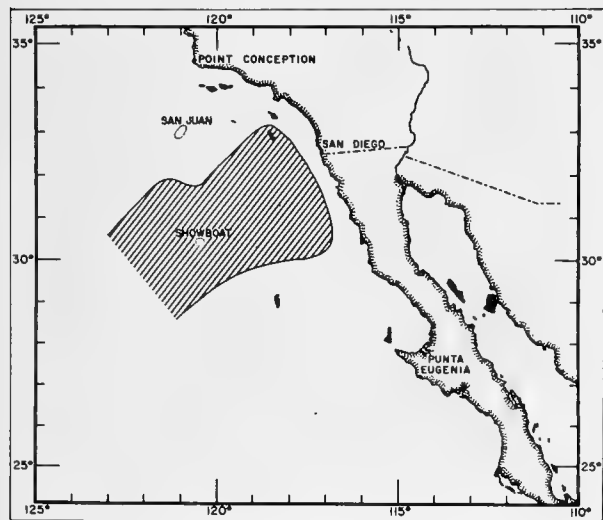


Fig. 1 - Cross-hatched area delineates the region expected to produce about two-thirds of the total July 1965 albacore tuna catch.

The forecast for 1965 consists of three separate estimates of (1) where, (2) when, and (3) how much tuna may be taken at the beginning of and during the summer season. The estimates given for 1965 are in more detail on the southern California offshore region for albacore, with only an estimate of the catch for bluefin.

Where: The area that is expected to produce the best albacore fishing in July off southern California is shown in fig. 1. That area has been determined from April temperature and salinity data taken from a depth of 10 me-



Fig. 2 - Albacore tuna (*Thunnus alalunga*).

ters (32.8 feet), and represents the "optimum area" that may produce more than two-thirds of the total July 1965 catch. Upwelling has been relatively weak this year in southern California and Baja California, and the albacore may move closer to shore because clear, blue water may extend farther inshore than usual.

When: Open ocean conditions in the region encompassing the usual migration route of albacore reflected considerable warming commencing as early as mid-February. That general warming trend prevailed through April, and suggests that the shoreward migration may occur earlier than in the last two years. In addition, the waters off Oregon and Washington were beginning to warm noticeably, and suggest that July landings may be near average.

How Much: It was estimated that June landings in southern California would be above the long-term average of 175,280 pounds. As in previous years, estimates of total annual albacore and bluefin landings are restricted by the data available to the region south of the United States-Mexican border for albacore, and for bluefin in the area to the north of the border. This year, about 12.6 million pounds of albacore is expected will be caught south of the United States-Mexican border, and about 8.6 million pounds of bluefin will be taken north of it. Those estimates are near the 14-year average landings for both species.

In 1964, the forecast for albacore landings south of the international border exceeded actual landings by only 13 percent, whereas actual bluefin landings were slightly more than half of the predicted amount. The cause for the major discrepancy in the bluefin estimate is most likely due to major changes in the fishing fleet. Whereas the albacore fleet has experienced no major changes in composition over the past few years, the bluefin fleet has changed greatly. During the past four years, the addition of most of the converted high-seas purse seiners to the bluefin tuna fishing fleet appears

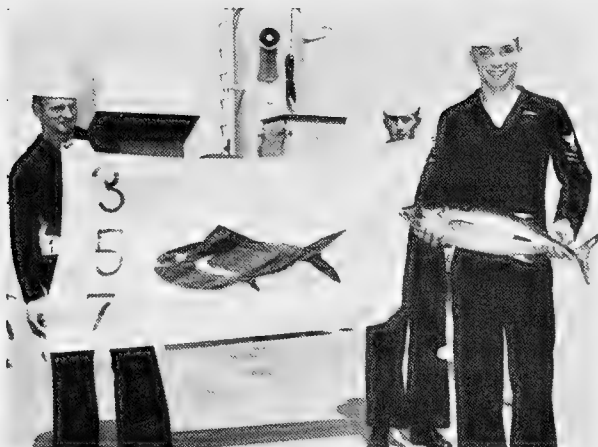


Fig. 3 - Men aboard a Navy radar picket vessel display a sample of their catch.

to have caused the center of production and fishing effort to be shifted farther south into Baja California offshore waters.

The U. S. Bureau of Commercial Fisheries planned to conduct an early-season survey of the "optimum area" for albacore by chartering two commercial albacore trollers. The vessels were to put out to sea on or after June 2 and, in conjunction with the California Department of Fish and Game research vessel N. B. Scofield (at sea from May 25 to June 23), were to report fishing conditions as they developed. Navy radar picket vessels were fishing since May 1, and were to report albacore catches as they occurred. Summary radio broadcasts were being made to the fishing industry to provide information on the shoreward movement of the summer albacore movement.

Note: See Commercial Fisheries Review, August 1964 p. 40.



## United States Fisheries

### IMPORTED FISHERY PRODUCTS ACCOUNT FOR HALF OF 1964 U. S. SUPPLY:

The United States continued in 1964 as the world's largest importer of fishery products despite very large untapped resources available in waters usually fished by U. S. commercial fishermen. For the second consecutive year, over half the U. S. supply of fish and shellfish in 1964 was from foreign sources. The estimated live weight of edible and industrial fishery products imported by the United

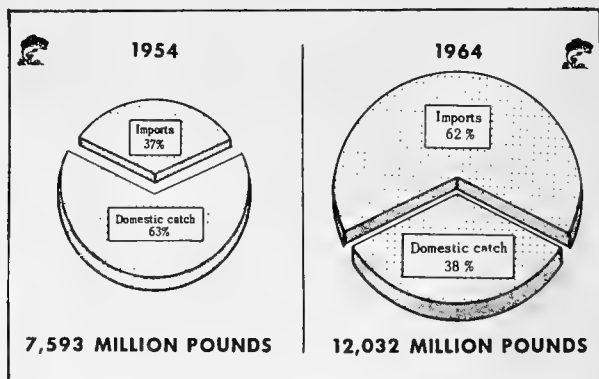


Fig. 1 - U. S. domestic supply of fishery products increased 58 percent since 1954.

States during the year was 7.5 billion pounds, or 62 percent of the total available supply of 12 billion pounds.

United States imports of edible fishery products in 1964 totaled 2.4 billion pounds (live weight basis), an increase of 5 percent from 1963. Of all fishery products used for human food in 1964 in the United States, 49 percent was imported. Imports of industrial fishery products were 5.1 billion pounds, up 18 percent from 1963. Over 71 percent of the total U. S. supply of industrial fishery products came from imports.

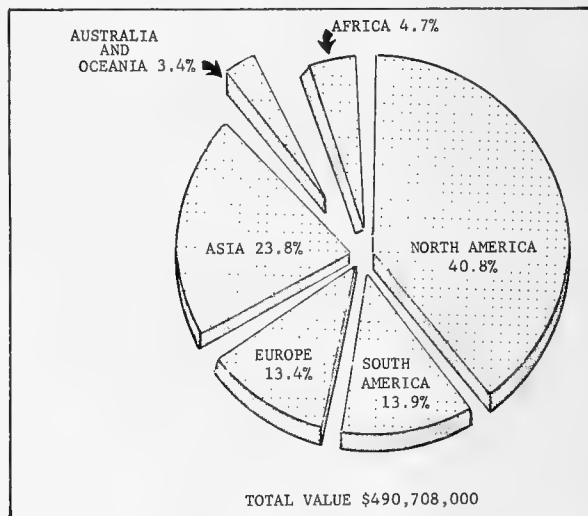


Fig. 2 - Value of U. S. imports from continent of origin, 1963.

In 1964 the U. S. catch of edible and industrial fish and shellfish dropped to 4.5 billion pounds, 7 percent less than in 1963 and the smallest since 1953. But the ex-vessel value of \$390 million was up nearly \$13 million



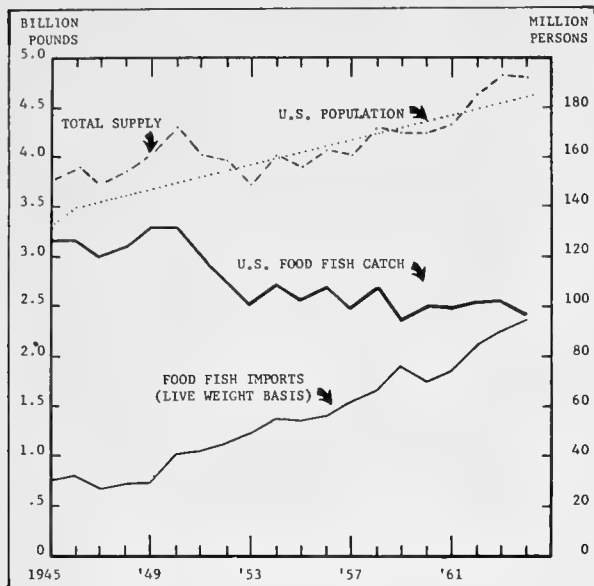


Fig. 3 - Relationship of U. S. population to food fish and imports, 1945-64.

from the previous year--the second highest value on record. The 1964 landings were lower for menhaden, Atlantic herring (sardines), Pacific halibut, mackerel, tuna, shrimp, and Atlantic ocean perch. The higher value for the year was due to larger catches of Pacific salmon, blue crab and king crab, as well as higher average prices for tuna, shrimp, and sea scallops.

Canned tuna sales from the domestic pack in 1964 were up from the previous year as against a decline in imports of canned tuna. While United States tuna landings in 1964 were lower (down 5 percent) than in the previous year, more imported frozen tuna than in 1963 was canned in the United States. The domestic tuna pack in 1964 was at a record high.

Note: See *Commercial Fisheries Review*, April 1965 p. 38.



## U. S. Fishing Vessels

### PAMPHLET ON RULES OF THE ROAD ISSUED BY COAST GUARD:

A pamphlet titled "Fishing Vessel Rules of the Road" has been issued by the U. S. Coast Guard. The new rules are based on the revised international rules that become effective September 1, 1965.

The new rules make substantial changes in light requirements, fog-signal procedures,

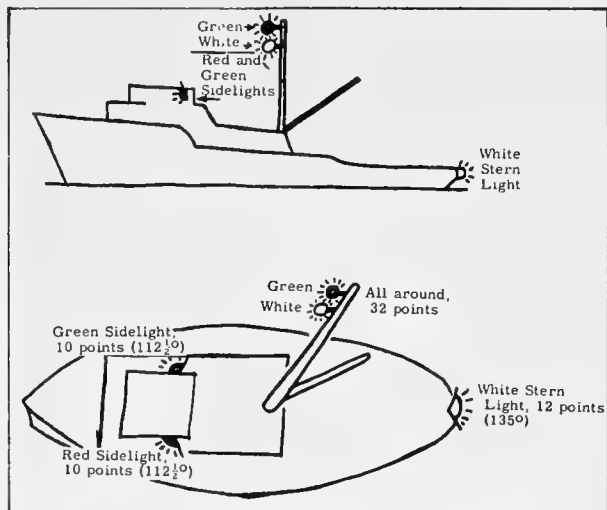


Illustration from booklet. Shows lights for vessels trawling (dragging of a dredge, net, or other apparatus through the water).

and other important aspects of Rules of the Road for fishing vessels on the high seas. Fishermen are urged by the Coast Guard to familiarize themselves with these rules before they become effective.



## U. S. Foreign Trade

### IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

United States imports of tuna canned in brine during January 1-May 1, 1965, amounted to 9,599,442 pounds (about 457,116 standard cases), according to preliminary data compiled by the U. S. Bureau of Customs. That was a decline of 18 percent from the 11,744,881 pounds (about 559,300 standard cases) imported during January 1-May 2, 1964.

The quantity of tuna canned in brine which can be imported into the United States during the calendar year 1965 at the  $12\frac{1}{2}$ -percent rate of duty is limited to 66,059,400 pounds (or about 3,145,685 standard cases of 48 7-oz. cans). Any imports in excess of that quota will be dutiable at 25 percent ad valorem.

\* \* \* \* \*

### U. S. FIRMS INVITED TO PARTICIPATE IN LEADING FOOD FAIRS OF EUROPE:

Plans have been announced to include United States processed fishery products among items vigorously promoted at two major Eu-

ropean food fairs this year. One will be held in Cologne, Germany, from September 25-October 3, and the other in Brussels, from October 30-November 14. Both are among the largest international food shows in the world.

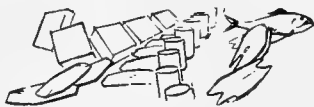
Donald L. McKernan, Director of the U. S. Bureau of Commercial Fisheries, said arrangements have been made for the United States fishery industry to display its products separately at the food fairs for the first time.

Special private trade areas will be set aside for United States exhibits. In addition to floor space, participating companies will have display facilities equipped with shelves and a storage cabinet for products and sampling utensils. Freezer space will be available. Display booths at each fair will surround a lounge where American representatives can meet with potential European customers. A full-time industry representative must be available at each exhibit.

Operation of the special trade areas will be similar to procedures followed at processed food exhibits held in United States Trade Centers abroad. The private trade areas are not open to the public.

Both of these fairs will stress processed food products. Any domestic firm, handling processed fishery products, will be eligible to participate. The fishery products to be displayed, however, must have been processed in the United States.

Each U. S. firm will be required to provide, at its expense, a full-time representative, either from the United States or abroad. Also, each company will be responsible for the expense involved in shipping its products to the food fair.



## Washington

### NEW 1965 STATE LAWS AFFECTING FISHERIES:

Following is a report from the Fishermen's News, Vol. 27, No. 7, on fisheries bills which were passed by the Washington State Legislature and signed into law by the Governor in 1965:

S. 252 abolishes the personal license and fee of \$10. That fee has been absorbed in the gear

license fee to complete a consolidation of licenses begun in 1959. As a result, a fishing vessel operator with an appropriate gear license may change crewmen without added licenses and may have any number of men aboard to assist in fishing. The basic gear license fee has been adjusted to reflect the average number of men aboard a particular type fishing vessel. Following are selected gear license fees in Washington under the new schedule: purse seine, resident \$145, nonresident \$230; gill nets, resident \$35, nonresident \$70; troll lines, resident \$27.50, nonresident \$55; otter trawl, beam trawl, shrimp trawl, resident \$87.50, nonresident \$135; shellfish pots, resident \$35, nonresident \$60.

H. 220 changes the "resident" and "non-resident" definitions as regards gear license fees. Under the new law, the residency of the fishermen actually operating the vessel or gear is the deciding factor. Previously the residency of the owner of the vessel or gear has been the determining factor.

S. 265 defines the primary market value of fishery landings as it relates to a base price to be used in applying the ad valorem 2 percent and 1 percent privilege and catch fees. Primary market value is defined as the ex-vessel or dockside price at all landing ports in the State and includes advance prices as well as final settlements. It does not include vessel or owner subsidies.

H. 219 redefines the fish buyer's license requirements to include all persons who purchase or receive fish at places other than the employer's business premises.

H. 218 redefines wholesale license provisions.

H. 217 redefines the Lummi Island reef net areas.

H. 216 abolishes the \$5 hard-shell clam license and provides that hard-shell clams may only be dug for commercial purposes on licensed clam farms. (Hard-shell clams may still be dug commercially on Indian reservations.)



## Wholesale Prices

### EDIBLE FISH AND SHELLFISH, MAY 1965:

Wholesale prices for edible fishery products (fresh, frozen, and canned) were up slightly in May 1965. At 109.2 percent of the 1957-59 average, the index rose 0.4 percent from April to May principally because of higher prices for several fishery products. As compared with May 1964, the overall index this May was up 3.6 percent because prices were generally higher for most products, except fresh-water fish, oysters, and canned salmon.

In the subgroup for drawn, dressed, or whole finfish, prices for fresh Great Lakes fish in May were down sharply from the high Jewish Holiday price level of the previous month—Lake Superior whitefish (down 31.8 percent) and yellow pike (down 35.0 percent). Those lower prices cancelled out higher prices at Boston for ex-vessel large haddock (up 6.5 percent) and the subgroup index dropped 4.4 percent from April to May. Prices for western halibut and salmon in May 1965 were unchanged from the previous month. Supplies of those species in May were still mostly frozen because market receipts of the fresh product

from the opening of the seasonal fishery were not much more than a trickle. As compared with the same month a year earlier, the subgroup index this May was down 1.3 percent. Although May 1965 prices were much higher than in May 1964 for large haddock (up 22.3 percent) and halibut (up 18.0 percent), lower prices for king salmon and fresh Lake Superior whitefish were responsible for the index drop during that same period.

Higher prices from April to May for South Atlantic fresh shrimp (wholesale price up 5 cents a pound) at New York City and shucked standard oysters (up 3.7 percent) at Norfolk resulted in a 3.8-percent increase in the subgroup index for processed fish and shellfish. As compared with May 1964, the subgroup index this May was 1.5 percent higher—prices for fresh haddock fillets were 12.0 percent higher, for shrimp up 6 percent, but for shucked oysters were down by 5.0 percent.

Wholesale prices at Chicago for frozen shrimp dropped 1.6 percent from April to May as against higher prices for frozen flounder and haddock fillets. The May 1965 subgroup index for processed frozen fish and shell-

Wholesale Average Prices and Indexes for Edible Fish and Shellfish, May 1965 with Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1957-59=100)			
			May 1965	Apr. 1965	May 1965	Apr. 1965	Mar. 1965	May 1964
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned) . . . . .					109.2	108.8	108.3	105.4
<b>Fresh &amp; Frozen Fishery Products:</b> . . . . .					112.9	113.3	112.5	107.4
<b>Drawn, Dressed, or Whole Finfish:</b> . . . . .					106.1	111.0	110.8	107.5
Haddock, lge., offshore, drawn, fresh . . . . .	Boston	lb.	.10	.09	74.0	69.5	87.4	60.5
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.41	.41	119.3	119.8	117.3	101.5
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.83	.83	115.3	115.3	115.3	127.8
Whitefish, L. Superior, drawn, fresh . . . . .	Chicago	lb.	.58	.85	86.6	126.9	93.3	92.5
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.65	1.00	106.4	163.7	139.2	94.2
<b>Processed, Fresh (Fish &amp; Shellfish):</b> . . . . .					118.9	114.5	112.3	117.2
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.33	.35	80.2	85.0	97.1	71.6
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	1.05	1.00	123.0	117.2	111.3	116.0
Oysters, shucked, standards . . . . .	Norfolk	gal.	7.13	6.88	120.2	115.9	115.9	126.5
<b>Processed, Frozen (Fish &amp; Shellfish):</b> . . . . .					109.4	109.5	109.3	94.7
Fillets: Flounder, skinless, 1-lb. pkg. . . . .	Boston	lb.	.39	.37	98.8	93.8	95.0	92.5
Haddock, sml., skins on, 1-lb. pkg. . . . .	Boston	lb.	.38	.37	109.9	108.5	112.9	104.1
Ocean perch, lge., skins on 1-lb. pkg. . . . .	Boston	lb.	.30	.30	105.2	105.2	108.7	105.2
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.93	.94	109.7	111.5	108.5	88.3
<b>Canned Fishery Products:</b> . . . . .					103.0	101.2	101.3	102.2
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. . . . .	Seattle	cs.	21.00	20.25	91.5	88.3	89.3	97.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs. . . . .	Los Angeles	cs.	11.56	11.44	102.6	101.6	101.6	102.1
Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs. . . . .	Los Angeles	cs.	7.13	7.13	120.9	120.9	120.9	103.9
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs. . . . .	New York	cs.	10.25	10.25	131.5	131.5	128.3	113.7

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

fish dropped only slightly (down 0.1 percent) as a result. As compared with May 1964, the index this May was up 15.5 percent because of much higher prices for frozen shrimp (up 24.2 percent) and several frozen fillet items. But prices for ocean perch fillets were the same as in May 1964.

The May 1965 index for canned fishery products rose 1.8 percent from the previous month. The market outlook for canned pink salmon appeared good, stocks continued to

move well, and prices were up 3.6 percent from a month earlier. Average prices for canned tuna (up 1.0 percent) were up slightly from April to May because of a nominal increase in prices for tuna packed under private label but prices for advertised brands were unchanged from the previous month. Prices paid by California canneries for ex-vessel tuna were higher during May. The subgroup index in May 1965 was up 0.8 percent from the same month a year earlier because of higher prices for all canned fish except salmon (down 5.7 percent).



#### SPACE AGE SALMON SALAD SERVED ASTRONAUT

A 238-calorie portion of freeze-dried salmon salad was included on the space menu of Astronaut James A. McDivitt during the Gemini 4 flight in June 1965. The salmon salad was one of the items specially chosen by McDivitt, who is reported to be a seafood connoisseur. Cost of a space meal is about \$255.

The salmon salad was served as a supper accompanied by pea soup, toast, fruit cocktail, and orange juice. All the food is freeze-dried, compressed, and dehydrated; it must be reconstituted with water. McDivitt and his co-Astronaut Edward H. White II picked out the food they wanted after trying out all the items available. White did not pick a fish dish. (The Evening Star, Washington, D. C., June 5, 1965.)



#### CORRECTION

The April 1965 issue, page 22, in the table "U. S. Supply of Fish Meal and Solubles, 1963-64," the item under domestic production shown as "herring, Alaska," should simply read "herring."



## International

### FISH MEAL

#### PRODUCTION AND EXPORTS FOR SELECTED COUNTRIES, JANUARY-FEBRUARY 1965:

Member countries of the Fish Meal Exporters' Organization (FEO) account for about 90 percent of world exports of fish meal. The FEO countries are Chile, Angola, Iceland, Norway, Peru, and South Africa/South-West Africa.

Table 1 - Exports of Fish Meal by Member Countries of the FEO, Jan.-Feb. 1965

Country	February		Jan.-Feb.	
	1965	1964	1965	1964
	. . . . (1,000 Metric Tons). . . .			
Chile	6.2	13.9	15.2	25.7
Angola	1/	2.9	1/	7.7
Iceland	6.0	8.5	15.6	20.0
Norway	12.5	13.5	25.7	40.7
Peru	130.2	100.7	295.1	202.6
So. Africa (including S.-W. Africa)	4.6	11.2	15.9	24.7
Total	159.5	150.7	367.5	321.4

Table 2 - Production of Fish Meal by Member Countries of the FEO, Jan.-Feb. 1965

Country	February		Jan.-Feb.	
	1965	1964	1965	1964
	. . . . (1,000 Metric Tons). . . .			
Chile	10.9	21.3	23.7	43.1
Angola	1/	4.0	1/	9.6
Iceland	5.0	6.5	9.2	12.3
Norway	18.7	6.4	24.6	15.0
Peru	122.3	125.2	316.4	320.8
So. Africa (including S.-W. Africa)	22.6	16.4	21.3	30.4
Total	179.5	179.8	395.2	431.2

1/Data not available.

Peru accounted for about 80 percent of the 367,500 metric tons of fish meal exported by FEO countries in January-February 1965.

\* \* \* \* \*

#### WORLD PRODUCTION, FEBRUARY 1965:

World fish meal production in February 1965 was down about 15 percent from the previous month due in large part to a labor dispute in Peru which reduced output. The decline was partly offset by higher production in Norway, Canada, Denmark, and South Africa.

World fish meal production in January-February 1965 was down slightly from that in the first 2 months of 1964. Output in early 1965 was down noticeably in Chile, but production was up in Norway, Canada, and Denmark.

World Fish Meal Production by Countries, February 1965 with Comparisons

Country	Feb.		Jan.-Feb.	
	1965	1964	1965	1964
	. . . . (Metric Tons). . . .			
Canada	9,233	3,368	14,674	6,773
Denmark	8,929	2,408	14,816	11,207
France	1,100	1,100	2,200	2,200
German Fed. Rep.	5,543	6,390	10,178	13,147
Netherlands	363	600	638	1,400
Spain	1/	1/	1/	1/
Sweden	1,067	415	1,657	1,485
United Kingdom	7,777	6,954	15,036	14,690
United States	1,994	1,663	4,399	3,382
Angola	1/	4,036	1/	9,584
Iceland	4,967	6,521	9,167	12,257
Norway	18,714	6,410	24,608	15,017
Peru	122,285	125,216	316,389	320,767
So. Afr. (including S.-W. Afr.)	22,712	16,947	31,456	31,249
Belgium	375	375	750	750
Chile	10,890	21,270	23,745	43,118
Morocco	-	590	-	860
Total	215,949	204,263	469,713	487,866

1/Data not available.

Note: Japan does not report fish meal production to the International Association of Fish Meal Manufacturers at present.

Most of the principal countries producing fish meal submit data to the International Association of Fish Meal Manufacturers monthly (see table).

## International (Contd.):

## FOOD AND AGRICULTURE ORGANIZATION

8TH ANNUAL SESSION OF  
THE GENERAL FISHERIES COUNCIL  
FOR THE MEDITERRANEAN:

The 8th Annual Session of the General Fisheries Council for the Mediterranean (GFCM) was held in Rome, May 10-15, 1965. Some 60 fisheries experts from 14 Mediterranean countries participated.



Major items on the agenda included the possibility of establishing a regional United Nations Special Fund project for the further development of the Mediterranean's fisheries. Another important topic was a synopsis, prepared jointly with the International Commission for the Scientific Exploration of the Mediterranean Sea, on the oceanography of the Mediterranean, and the launching of a possible Mediterranean-wide sardine-tagging program. The sardine is of significant commercial importance to the fishing nations of the Mediterranean. Tagging is a basic tool for determining the growth, distribution, migration habits, mortality rate, stock, and population size of that species.

The GFCM has already sponsored a good deal of work on sardine-tagging, including a seminar held in 1964, in Split, Yugoslavia. If a Mediterranean-wide sardine-tagging program were launched, it would be the first of its kind carried out in the region.

About 55 technical and 25 working papers, covering all phases of present Mediterranean fishing problems, were presented during the Session. All of the papers were discussed in the Council's five technical committees.

Member nations of GFCM are France, Greece, Israel, Italy, Lebanon, Libya, Monaco, Morocco, Spain, Tunisia, Turkey, the United Arab Republic, the United Kingdom, and Yugoslavia. (Food and Agriculture Organization, Rome, May 4, 1965).

Note: See Commercial Fisheries Review, January 1965 p. 56.

\* \* \* \* \*

PLAN FOR FUTURE DEVELOPMENT  
OF MEDITERRANEAN FISHERIES URGED:

Views on the fertility of the Mediterranean Sea are varied and often contradictory, said the Director of the Fisheries Division, Food and Agriculture Organization (FAO), at the opening session of the General Fisheries Council of the Mediterranean, held in Rome, May 10-15, 1965.

"The Mediterranean is for some people a very poor sea which cannot support a rewarding fishery," he added as he called on the Mediterranean nations to draw up a general plan for the future development of that Sea's fishing resources. He pointed out that some stocks have been overexploited and that they are in a very advanced overfished state. On the other hand, he also pointed out that some optimistic views have been expressed on the existence of other fish stocks that can support much more substantial fisheries than they do now.

According to the FAO Fisheries Division director, the GFCM can play a central part in determining just what the Mediterranean's fishing potential really is. Immediate needs are the collection and analysis of existing oceanographic information, improved knowledge of the kinds and abundance of fish, more efficient fishing and processing methods, and better management.

The task of developing the Mediterranean's fisheries is too big to be undertaken by individual nations. Any successful development would have to be carried out under a unified plan, developed and executed through the GFCM. The best means of carrying out such a general development plan would probably be through an integrated series of fisheries projects designed to meet the needs of individual countries as well as the Mediterranean generally.

The Fisheries Division chief told delegates at the opening session that aid in financing a



## International (Contd.):

general program could be sought through the United Nations Special Fund, the United Nations Expanded Program of Technical Assistance, the World Bank, or through bilateral aid programs integrated into an overall plan, and that the FAO would be willing to aid the GFCM in seeking such assistance.

At the opening meeting, Spain's Director General of Fisheries and Chairman of the GFCM's 8th Annual Session said he had no doubt that, through modern scientific methods, Mediterranean fishing could be developed far beyond its present productivity. He added, "There are still many unharvested areas of our Sea. What we need is more research and experimental fishing expeditions to determine the size of the marine resources and their sustainable yield. This can only be accomplished through unity and cooperation." (Food and Agriculture Organization, Rome, May 10, 1965.)

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#### EIGHTH REGIONAL CONFERENCE FOR LATIN AMERICA:

The Food and Agriculture Organization (FAO) held its Eighth Regional Conference for Latin America in Vina del Mar, Chile, March 13-29, 1965.

The Conference passed five resolutions of importance to Latin American fisheries. (These conferences serve, among other things, as forums wherein the countries of an FAO Region may exchange information and consult on common problems.) The five resolutions on fisheries favored:

1. Establishment of a regional freshwater fisheries institute in Bolivia.
2. More work by FAO to find a way of processing fish meal in a form suitable for human consumption.
3. Preparation of an international convention for the rational exploitation of Atlantic tuna.
4. Establishment of a South Pacific regional fisheries advisory commission.
5. More attention to the discovery and development of fishery resources,

assessment of stocks, research on fishery biology, more training, improved processing, stronger fishery administrative services, and strengthening of international cooperation.

In connection with the last resolution, the Conference supported the FAO Director-General's proposal to strengthen FAO's role in fisheries, and establish an FAO Fisheries Department.

\*\*\*\*\*

#### SEATTLE MAN APPOINTED CHAIRMAN OF 3RD TECHNICAL MEETING OF FISHING BOATS TO BE HELD IN SWEDEN:

George C. Nickum of Seattle, Wash., was named Chairman of the 3rd International Technical Meeting on Fishing Boats which will be held at Goteborg, Sweden, October 23-29, 1965. The announcement was made by the Fisheries Division, Food and Agriculture Organization (FAO), which is sponsoring the meeting jointly with the Swedish Government.

Nickum is Managing Director and President of one of the three largest firms of consulting naval architects in the United States. He is a member of FAO's Panel of Fisheries Experts; the U. S. Society of Naval Architects and Marine Engineers, and former chairman of its Pacific Coast Section; the British Royal Institution of Naval Architects; and a member of the British Northeast Coast Institution of Engineers and Shipbuilders.

The chief of FAO's Fishing Boat Section and Secretary for the forthcoming Goteborg meeting says Nickum "has been responsible for a wide variety of ship designs, from amphibians to floating drydocks, from hydrofoils to destroyer escorts, from ferries to fish factoryships, and from oceanographic vessels to offshore oil rigs, not to mention fishing vessels of many classes."

The main theme of the Goteborg meeting will be the needs of developing countries for small fishing craft--boats under 100 gross tons--especially adaptable for fishing their own national waters. (Food and Agriculture Organization, Rome.)

Note: See Commercial Fisheries Review, May 1965 p. 50.

#### LAW OF THE SEA

#### CERTAIN INTERNATIONAL CONVENTIONS RATIFIED BY FINLAND:

On February 16, 1965, Finland deposited her ratifications of the four Conventions formu-

### International (Contd.):

lated by the 1958 United Nations Conference on the Law of the Sea. Those Conventions are the (1) Convention on the Territorial Sea and the Contiguous Zone; (2) Convention on the High Seas; (3) Convention on the Continental Shelf; and (4) Convention on Fishing and Conservation of the Living Resources of the High Seas. The first three of those Conventions have entered into force, and the latter has at least 18 of the 22 ratifications needed to enter into force.

Note: See Commercial Fisheries Review, May 1965 p. 55; Mar. 1965 p. 83; Jan. 1965 p. 59; Dec. 1964 p. 39; Nov. 1964 p. 70; Oct. 1964 p. 49; June 1961 p. 90; May 1960 p. 40.

### OCEANOGRAPHY

#### INTERNATIONAL CONFERENCE ON TROPICAL OCEANOGRAPHY:

An International Conference on Tropical Oceanography will be held at Miami Beach, Fla., November 18-24, 1965. The meetings are sponsored by the Institute of Marine Science, University of Miami, and will coincide with the Institute's 21st birthday and the formal dedication of its entire Virginia Key campus. It is expected that the new marine laboratory of the U. S. Bureau of Commercial Fisheries, at an adjacent site on Virginia Key, will also be completed by that time.

The International Conference will reflect the increased interest in tropical oceanic areas. Research in those areas has been intensified during the past few years. Some of the papers to be presented will deal with scientific results of the International Indian Ocean Expedition (IIOE) and the International Cooperative Investigations of the Tropical Atlantic (ICITA), and will constitute important contributions to knowledge of the sea. Ten symposia to be held at the conference will deal with circulation, carbonate, ecology, tectonics, deep-sea biology, zoogeography, behavior, nutrient cycles, economics, and high-sea fisheries.

The meetings will be held in cooperation with the Gulf and Caribbean Fisheries Institute (Nov. 15-19) and the International Game Fish Association (November 12 and 13). Delegates from all over the world are expected to attend the conference. (News of Institute of Marine Science, Miami, Fla., March 24, 1965.)

### RADIATION PRESERVATION

#### EUROPEAN STUDIES OF RADIATION PRESERVATION OF FISHERY PRODUCTS:

Following is a report from Food Irradiation, July-December 1964, on certain European studies concerning fishery products:

France: The varied factors affecting the shelf life of fish after irradiation are being studied. Irradiation preservation of whole fish and gutted fish as well as fish fillets is being investigated. The influence of various packing methods on irradiation procedures is also being studied.

West Germany: The German Federal Government plans to establish a research center at Karlsruhe to study food irradiation. In the meantime, a number of irradiation study projects are being conducted with available facilities. Work is being done on dosimetry problems as well as on the possibility of sensitization of micro-organisms. Other studies are aimed at finding ways of determining whether or not a product has been irradiated. One indicator found by German scientists is the surface changes in plastic coverings for prepacked foods which have been irradiated.

The Battelle Institute of Germany is studying ways to extend the shelf life of vinegar-pickled herring by substituting irradiation for preservatives. The first part of the project, which was begun in September 1963, has been devoted to microbiological and analytical investigations of the influences of irradiation and of storage. Wholesomeness and feasibility studies will be made in the second phase of the project.

Italy: An irradiation study of fresh and frozen fishery products in demand on the Italian market is being carried out jointly by the Perugia Radiobiological Center and the Pescara Veterinary Institute for Hygienic Control of Fish Products. Under this program, shrimp, cod, lemon sole, and other species are treated with an irradiation of 0.3 Mrad and then tested for: (1) bacteria which develop at the temperature of melting ice and at room temperature, (2) volatile amines and peroxides, and (3) flavor, odor, and appearance.

Italian studies are also being carried out on irradiation control of salmonella and other

## International (Contd.):

bacteria in such animal-feeding stuffs as fish meal. Besides bacteriological tests, chemical tests are applied to irradiated meals to determine if changes have taken place in their amino acids and "protein relative value."

Netherlands: Irradiation of fish meal to eliminate salmonella is being studied by the CIVO Institute.

Norway: Irradiation research in Norway is limited by a lack of facilities, but there is a growing interest in the possibility of irradiation preservation of foods, particularly fishery products.

Note: In the United States, the U. S. Bureau of Commercial Fisheries is operating an irradiation facility at Gloucester, Mass., under an agreement with the Atomic Energy Commission to investigate the pasteurization of fishery products. For additional information on United States studies, see Commercial Fisheries Review, Dec. 1964 p. 57 and Nov. 1964 p. 54.

## WHALING

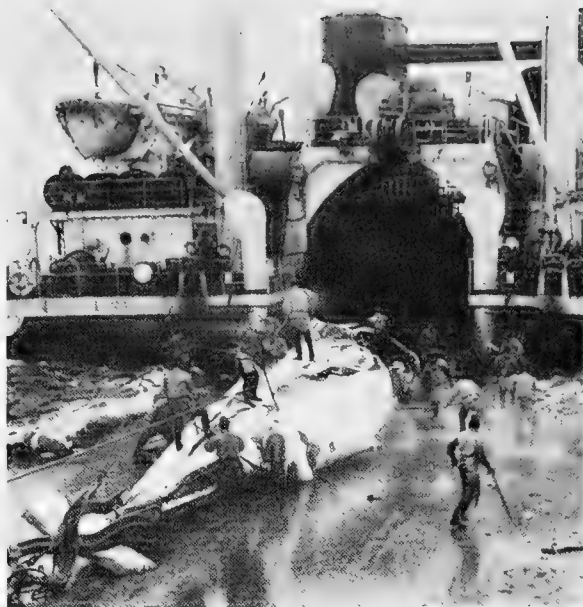
## ANTARCTIC INTERNATIONAL QUOTA CUT RECOMMENDED:

Delegates from 12 nations, at the conclusion of a special 4-day International Whaling Conference in London, May 3-6, 1965, approved a resolution recommending that the international quota for the 1965/66 Antarctic whaling season be reduced to 4,500 blue-whale units (each unit is calculated to equal 2 fin whales, or 2½ humpback whales, or 6 sei whales).

The resolution, which was addressed to Governments of countries belonging to the International Whaling Commission, also recommended Antarctic quota reductions in the succeeding two seasons. It was recommended that by 1967/68 the catch quota should not exceed the maximum sustainable yield. That would give the depleted whale herds in the Antarctic a chance to begin their recovery.

The recommendations were to be considered by the International Whaling Commission at its 17th Annual Meeting scheduled to open in London, June 28, 1965. At its 17th Annual Meeting, the Commission also planned to hear from a special scientific committee set up to assess the condition of North Pacific whale stocks.

Last year, at its 16th Annual Meeting in June 1964, the International Whaling Commission was unable to agree on a quota for the Antarctic. By informal agreement, the active



Cutting up a whale for processing aboard a Japanese whaling factoryship in the Antarctic.

Antarctic whaling countries (Japan, U.S.S.R., and Norway) established a 1964/65 quota of 8,000 blue-whale units, of which only 6,984 were actually caught. Giving weight to conservation arguments has been the striking decline in the Antarctic whale catch from 8,428 blue-whale units in 1963/64 and 11,299 units in 1962/63. (News of Norway, May 13, 1965, and unpublished sources.)

Note: See Commercial Fisheries Review, June 1965 p. 44; April 1965 p. 74; Sept. 1964 p. 54.

\* \* \* \* \*

## INTERNATIONAL WHALING CONVENTION AMENDED:

Amendments to paragraphs 2, 4(1), 6(3), 9(a), and 9(b) to the schedule to the International Whaling Convention of 1946 entered into force October 1, 1964, with the exception of paragraph 6(3), which entered into force January 22, 1965, except for Japan, Norway, the U.S.S.R., and the United Kingdom.

The amendments were adopted at the 16th annual meeting of the International Whaling Commission which was held June 22-26, 1964, in Sandefjord, Norway.

Note: See Commercial Fisheries Review, Sept. 1964 p. 54.



## Angola

### FISH OIL PRODUCTION AND EXPORTS, 1963-1964 AND OUTLOOK FOR 1965:

Fish oil production in Angola is estimated to have increased from 3,579 metric tons in 1963 to 5,000 tons in 1964. A forecast calls for an output of 8,000 tons of fish oil by the Angola reduction industry in 1965. (Editor's Note: A Government loan project to help modernize Angola's fish reduction industry is said to include plans to equip fish meal plants for full extraction of fish oil.)

Angola's Exports of Fish Oil, 1963-1964		
Country of Destination	1964	1963
	(Metric Tons)	
Netherlands . . . . .	4,731	2,193
West Germany . . . . .	1,434	451
France . . . . .	902	-
Portugal . . . . .	283	478
Spain . . . . .	29	-
Total . . . . .	7,379	3,122

Angola's exports of fish oil increased from 3,122 tons in 1963 to 7,379 tons in 1964, due to larger shipments to the Netherlands, West Germany, and France. (Agricultural Attache, United States Embassy, Leopoldville, May 6, 1965.)

Note: See Commercial Fisheries Review, June 1965 p. 45 and Feb. 1965 p. 84.



## Argentina

### FISH MEAL AND OIL PRODUCTION AND EXPORTS, 1962-1964:

Fish Meal: Production of fish meal in Argentina from salt-water fish increased from about 3,000 metric tons in 1962 to over 10,000 tons in 1964. Much of the increase was taken by the domestic mixed feed industry. Argen-

Argentina's Production and Exports of Fish Meal and Oil, 1962-1964			
Item	1/1964	1963	1962
	(Metric Tons)		
Production:			
Fish meal:			
Salt-water . . . .	10,600.4	6,636.3	3,248.0
Fresh-water . . .	1,299.3	1,418.9	1,273.0
Fish oil:			
Fish-body oil . .	1,512.6	1,135.8	718.5
Shark-liver oil . .	2/	63.1	0.7
Export:			
Fish oil . . . . .	576.6	472.1	383.3
Fish meal . . . . .	1,867.2	3,978.0	1,584.4
1/Preliminary. 2/Not available.			

tine exports of fish meal declined in 1964 to a level only a little above that in 1962.

Fish Oil: Although showing some increase, Argentine output of fish oil has not kept up with the rapid expansion in meal production. In 1964, Argentine fish oil production totaled 1,512 tons and exports amounted to 576 tons. (Agricultural Attache, United States Embassy, Buenos Aires, April 26, 1965.)

Note: See Commercial Fisheries Review, Aug. 1964 p. 54.



## British Honduras

### FISHERY TRENDS, EARLY 1965:

The fisheries center at Belize City in British Honduras annually prepares about 400,000 pounds of frozen spiny lobster tails for export, mainly to the United States. The spiny lobsters are taken mainly in shallow coastal waters off British Honduras, and overfishing is viewed with some concern by the Government. The resource has been the subject of several surveys and studies.

As regards fisheries potential, the reefs and keys off British Honduras are said to offer good fishing for snapper and other fish. Export markets for finfish are being sought.

Note: See Commercial Fisheries Review, Oct. 1963 p. 45.



## British West Indies

### BARBADOS SHRIMP FISHERY TRENDS, 1964:

The United States-owned shrimp processing company established in Barbados continued to expand its local operations in 1964 and now has a fishing fleet of 25 to 30 trawlers. During 1964 the firm exported 1.5 million pounds of frozen shrimp, nearly all to the United States.

The firm's expansion plans now call for an eventual fleet of 50 trawlers, rather than the 100 vessels anticipated earlier. The problem of expanding the government-controlled freezing and storage facilities to keep abreast with a steadily increasing trawler fleet has not been completely resolved. The government-controlled Barbados Marketing Corporation is reluctant to expand those facilities without adequate assurance that the shrimp-processing firm will remain in Barbados for a considerable period of time. The enterprise,

**MAP OF  
BARBADOS  
B.W.I.**

Scale of Miles 0 1 2

Province Boundaries Main Roads

ATLANTIC OCEAN

Towns and Landmarks labeled include: Spring Hall, St. Lucy, Fairfield, Colleton, Portland, Greenland, St. Peter, St. Andrew, St. Joseph, St. John, St. Thomas, St. George, St. Philip, Christ Church, St. Michael, Lazarus, Bridgetown, Carlisle Bay, Havelock, West Hill, St. Lawrence, Maxwell's Coast, Glen, Spencer's, Marchfield, Three Houses, Randel, Ellerton, Locust Hall, Warren, Welcheson Hall, Half-town, Bolax, Speightstown, St. Andrews, Bruce Vole, Gethsemane, Goodwill, and others.

Canadian Exports of Fish Meal and Oil, 1963-64		
Item	1/1964	1/1963
<u>Fish meal:</u>	. . . (Short Tons) . . .	
Herring . . . . .	50,498	45,150
Other . . . . .	11,992	10,404
Total . . . . .	62,490	55,554
<u>Fish oil &amp; fish-liver oil:</u>		
Cod-liver . . . . .	3,482	5,233
Herring, industrial . . . . .	11,646	474
Total . . . . .	15,128	5,707
1/ Preliminary.		

## Canada (Contd.):

With sharply higher prices on the world fish oil market, Canadian exports of herring oil in 1964 recovered from the extremely low level of 1963. But shipments of cod-liver oil were down in 1964. (Foreign Agriculture, April 26, 1965, U. S. Department of Agriculture.)

\* \* \* \* \*

MARINE-OIL PRODUCTION, USE,  
AND FOREIGN TRADE, 1963-1964:

Highlights of the Canadian marine oil industry in 1964 were a sharp rise in exports and, by contrast, an even sharper drop in imports. Major factors affecting the industry in 1964 were rising prices for marine oil and shifts in use of marine oil by the margarine industry.

Table 1 - Canadian Production of Marine Oils, 1962-1964 and Average for 1956-60

Item	1/1964	2/1963	1962	5 Yr. Average 1956-1960
..... (1,000 Pounds) .....				
Atlantic <sup>3/</sup> . . . . .	13,770	11,757	10,792	13,146
British Columbia (herring oil) <sup>4/</sup> . . . . .	44,545	52,843	41,031	29,552
Total . . . . .	58,315	64,600	51,823	42,698
1/Preliminary. 2/Revised. 3/Consists mainly of body oil and liver oil from groundfish species, herring, and seals. 4/Consists entirely of herring oil. Note: Production data converted to pounds using the factor 9.3 pounds equal 1 imperial gallon.				

Canada's herring oil exports were up from about 1 million pounds in 1963 to over 23 million pounds in 1964 (including over 19 million pounds to the United Kingdom and almost 4 million pounds to the United States). Total Canadian marine-oil exports increased from 17.6 million pounds in 1963 to 34.7 million pounds in 1964.

Table 2 - Canadian Imports of Marine Oils, 1963-1964

Country of Destination	1/1964	2/1963
..... (1,000 Pounds) .....		
United States . . . . .	626	12,543
Iceland . . . . .	-	11,864
United Kingdom . . . . .	212	614
Norway . . . . .	242	255
Other countries . . . . .	12	582
Total . . . . .	1,092	25,858
1/Preliminary. 2/Revised.		

By contrast, Canadian imports of marine oil fell from over 25 million pounds in 1963

to only about 1 million pounds in 1964. The cutback mainly affected the United States and Iceland, which had been important suppliers of fish oil to Canada in recent years.

Table 3 - Canadian Exports of Marine Oils by Country of Destination, 1962-1964

Commodity and Country of Destination	1/1964	2/1963	1962
..... (1,000 Pounds) .....			
<b>Cod-Liver Oil:</b>			
United Kingdom . . . . .	3/	1,330	1,288
United States . . . . .	3/	9,136	4,900
Other countries . . . . .	3/	-	-
Total cod-liver oil . . . . .	7,000	10,466	6,188
<b>Other Fish-Liver Oils:</b>			
Total all countries . . . . .	162	12	34
<b>Herring Oil:</b>			
United Kingdom . . . . .	19,459	911	-
United States . . . . .	3,807	36	88
Australia . . . . .	25	-	-
Total herring oil . . . . .	23,291	947	88
<b>Whale Oil:</b>			
United Kingdom . . . . .	1,344	1,726	593
Italy . . . . .	739	2,228	-
Netherlands . . . . .	-	896	-
Australia . . . . .	673	-	-
United States . . . . .	405	60	-
Other countries . . . . .	-	8	667
Total whale oil . . . . .	3,161	4,918	1,260
<b>Other Marine Oils:</b>			
United States . . . . .	1,113	1,302	126
Other countries . . . . .	-	-	20
Total other marine oils . . . . .	1,113	1,302	146
Total marine oil exports . . . . .	34,727	17,645	7,716
1/Preliminary. 2/Revised. 3/Breakdown not available.			

Total domestic production of marine oil in Canada in 1964 was down about 10 percent from the previous year. The decline was due to lower output of British Columbia herring oil (down 16 percent in 1964). Canadian herring oil prices began rising in the fourth quarter of 1964, reaching a high in December of 13.1 Canadian cents a pound f.o.b. Toronto. Earlier in the year, herring oil prices at Toronto had held fairly steady at about 10.7 cents a pound.

Trends in the margarine industry have an important bearing on marine-oil trade, since marine oil can be substituted for vegetable oil in both margarine and shortening. The striking increase in herring oil exports to the United Kingdom was probably due to its increased use in British margarine. (Canadian exports of soybean oil to the United Kingdom dropped in 1964.) On the other hand, the reverse of that process was seen in the Canadian domestic industry where use of marine oil in margarine dropped from 64.5 million pounds in



## Canada (Contd.):

1963 to 29.7 million pounds in 1964. The use of marine oil in Canadian shortening dropped from 22.9 million pounds in 1963 to 13.5 million pounds in 1964. (Agricultural Attache, United States Embassy, Ottawa, April 17 and 22, 1965.)

Note: See *Commercial Fisheries Review*, Dec. 1964 p. 84, Aug. 1964 p. 56.



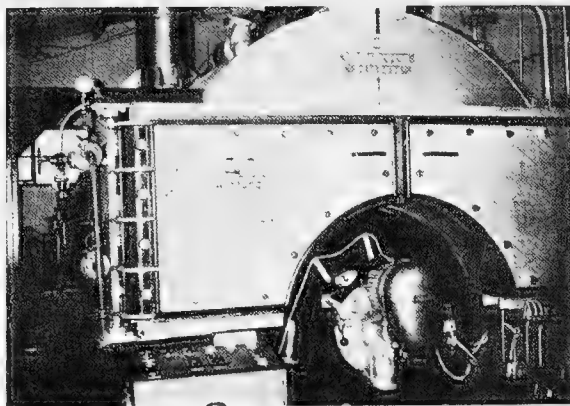
## Chile

FISH MEAL INDUSTRY TRENDS,  
FIRST QUARTER 1965:

Despite poor fishing during the latter part of 1964, Chilean production and exports of both fish meal and oil set new records in 1964. According to the Chilean Fisheries Development Institute, production of fish meal totaled 156,638 metric tons (up 69 percent from 1963) and exports of 146,450 tons exceeded the previous year's level by 70 percent. Fish oil pro-

duction in 1964 was 16,177 tons and exports totaled<sup>1/</sup> 12,568 tons, up 28 percent and 7 percent, respectively, from the preceding year.

An anchoveta shortage coupled with excess capacity in the Chilean reduction industry makes the 1965 outlook much less promising. Provisional data for 1965 show an anchoveta catch of 84,000 tons in January and 67,000 tons in February, a decline of more than 50 percent from the catch in the first 2 months of 1964. Reports of fish meal plants in financial crisis are increasing, and unemployment is rising in Tarapaca Province, where most of the fish meal plants are located. Shortly after the end of the first quarter of 1965, one large Iquique plant announced it was shutting down. If more abundant raw material sources are not located soon, other plants will also have to close.



Boiler room of fish meal plant in San Antonio, Chile.



Those developments are building up pressure for aid to the threatened industry. Increased attention is being given to scientific study of marine resources and to the merits of conservation, but those are long-range measures. The Production Development Corporation of Chile (CORFO) is no longer extending credits to build new fish meal plants, and the Navy has stopped granting property concessions for new plants. But those steps provide no direct relief to existing concerns. The Government is under increasing pressure to extend new loans, buy meal for future delivery, reinstitute export subsidies, declare a moratorium on principal payments due (as was recently done for ship owners), or even to take over the industry. Some new Government activity seems probable unless the elusive anchoveta return in quantity.

<sup>1/</sup>This amount does not agree with that shown in table on p. because source is different.

## Chile (Contd.):

(United States Embassy, Santiago, April 23, 1965.)

Note: See Commercial Fisheries Review, June 1965 p. 50, May 1965 p. 63.

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# EXPORTS OF FISH MEAL AND OIL BY COUNTRY OF DESTINATION, 1962-1964:

Fish Meal: Expansion of the Chilean reduction industry resulted in sharply higher fish meal exports in 1964. Much of the increase went to West Germany, the Netherlands, and Belgium, the leading buyers of Chilean fish meal in 1964. But shipments to the United States were down in 1964, accounting for less than 10 percent of the total.

Chilean Exports of Fish Meal and Oil, 1962-1964			
Country of Destination	1964	1963	1962
	. . . . (Metric Tons). . . .		
<b>Fish meal:</b>			
Belgium . . . . .	23,099	11,352	10,478
West Germany . . .	41,186	10,026	10,191
Netherlands . . . .	38,118	8,655	15,369
France . . . . .	7,855	1,850	4,025
Italy . . . . .	3,500	2,050	600
Poland . . . . .	2,000	2,000	2,500
Spain . . . . .	1,300	8,600	4,000
United Kingdom . .	14,654	6,509	5,974
United States . . .	13,103	19,757	11,771
Venezuela . . . . .	370	10,363	5,962
Other countries . . .	1,265	5,157	1,300
<b>Total fish meal</b>	<b>146,450</b>	<b>86,319</b>	<b>72,170</b>
<b>Fish oil:</b>			
West Germany . . .	181	1,776	2,256
Netherlands . . . .	12,755	9,625	8,035
Other countries . . .	822	142	618
<b>Total fish oil . .</b>	<b>13,758</b>	<b>11,543</b>	<b>10,909</b>

Source: Chilean Customs Office.

Fish Oil: Chilean exports of fish oil increased much less than fish meal in 1964 because of the relatively low oil yield of anchoveta during the past season. The Netherlands has taken the bulk of Chilean fish oil exports during the last 3 years. (Foreign Agriculture, U. S. Department of Agriculture, May 10, 1965.)



## Cuba

## TUNA FISHERIES EXPANSION:

The Fisheries Corporation of the Cuban Government plans to buy three or four tuna fishing vessels from Spain, according to a report in the Japanese periodical Asahi, April 25, 1965.

In 1963, Cuba acquired five 350-ton tuna vessels from Japan, together with the services of about 80 Japanese fishermen who came to Cuba to give technical advice. Early in 1965, about 50 of those Japanese technicians returned home. To replace those technicians and to obtain crewmen for the vessels to be ordered from Spain, the Cuban Government was reported trying to recruit another 80 Japanese fishermen.

Note: See Commercial Fisheries Review, April 1963 p. 46, Aug. 1962 p. 73.



## Denmark

# EXPORTS OF FROZEN FISH FILLETS AND BLOCKS AND RAINBOW TROUT, JANUARY-FEBRUARY 1965:

Denmark's exports of frozen fish fillets and blocks (mostly groundfish) during January-February 1965 amounted to 7.8 million pounds. The January 1965 exports totaled almost 3.0 million pounds; February 4.8 million pounds.

Exports of frozen rainbow trout in the first 2 months of 1965 totaled 2.7 million pounds. In January 1965 those exports were almost 1.4 million pounds; February 1.3 million pounds.

\* \* \* \* \*

## FISHERY TRENDS, JANUARY-MARCH 1965:

Landings: Danish fishery landings in home ports by Danish fishermen during January-March 1965 were up 26 percent from the same period in 1964. Landings increased for industrial fish (up 251 percent), cod and codlike fish (up 19 percent), and herring (up 12 percent). Other important species showing increases were salmon, pond trout, and shrimp, but landings of flatfish, brisling, and Norway pout were down. During the period, there were lower direct landings in foreign ports by Danish vessels and in Danish ports by foreign vessels.

## Denmark (Contd.):

Table 1 - Danish Fishery Landings, January-March 1965 and 1964		
Species	Jan.-Mar.	
	1965	1964
	. . (Metric Tons) . .	
<u>Landings in Denmark by</u>		
<u>Danish vessels:</u>		
Flatfish 1/ . . . . .	10,359	13,145
Cod 2/ . . . . .	41,660	25,766
Herring . . . . .	77,615	69,436
Brisling . . . . .	792	1,868
Mackerel . . . . .	274	215
Eels . . . . .	54	26
Salmon . . . . .	482	-
Pond trout . . . . .	1,999	1,835
Other fish 3/ . . . . .	36,389	19,885
Mussels . . . . .	4,511	4,657
Starfish . . . . .	991	1,466
Shrimp, lobster, and other shellfish . . . . .	1,215	1,104
Total . . . . .	176,341	139,403
Landings in Denmark by foreign vessels . . . . .	45,194	50,374
Landings in foreign ports by Danish vessels . . . . .	291	688
1/Plaice, flounder, dab, common sole, etc. 2/Includes haddock, coalfish, hake, ling, etc. 3/Mostly industrial fish such as Norway pout, sand eels, etc. Source: Ministry of Fisheries.		

**Processing:** Of the fishery products processed during the first quarter of 1965, only canned fish was down in quantity from the same period a year earlier. During the first quarter of 1965, substantially more cod and cod-like fish and herring were processed as fresh or frozen fish, but production of plaice fillets was down because of lower landings of that species.

Table 2 - Danish Production of Processed Fishery Products, January-March 1965		
Product	Jan.-Mar.	
	1965	1964
	. . (Metric Tons).	
<u>Canned:</u>		
Herring and sprats . . . . .	1,142	1,395
Mackerel . . . . .	64	74
Other fish . . . . .	1,894	1,960
Mussels . . . . .	173	184
Other shellfish . . . . .	186	175
Total . . . . .	3,459	3,788
<u>Semi-preserved:</u>		
Herring and sprats . . . . .	1,467	1,225
Other fish . . . . .	128	103
Mussels . . . . .	158	108
Total . . . . .	1,753	1,436

(Table continued on next column.)

Product	Jan.-Mar.	
	1965	1964
	. . (Metric Tons).	
<u>Fresh and frozen fillets:</u>		
Cod . . . . .	9,892	7,281
Codlike fish 1/ . . . . .	868	292
Plaice . . . . .	2,575	2,738
Other flatfish . . . . .	326	254
Herring . . . . .	15,006	10,175
Other fish . . . . .	43	35
Total . . . . .	28,710	20,775
<u>Smoked:</u>		
Herring and sprats. . . . .	312	229
Mackerel . . . . .	170	114
Eels . . . . .	147	169
Salmon and trout . . . . .	189	105
Other fish and shellfish . .	107	62
Total . . . . .	925	679
<u>Miscellaneous:</u>		
Force meat 2/ . . . . .	533	391
Salted herring . . . . .	8	4/
Dry-salted cod . . . . .	154	4/
Other fishery products . . .	360	-280
Total . . . . .	1,055	4/
<u>Industrial products:</u>		
Meal . . . . .	23,686	14,511
Oil . . . . .	5,651	5,316
Ensilage 3/ . . . . .	1,181	1,214
Solubles . . . . .	1,770	1,405
Total . . . . .	32,288	22,446
1/Haddock, coalfish, hake, ling, etc. 2/Ground fish, milk, and flour. 3/Chemically-treated raw fish. 4/Not available. Source: Ministry of Fisheries.		

Production of fish meal in the first quarter of 1965 was up substantially from the same period in 1964, and there was some increase in the production of fish oil as a result of heavier industrial fish landings than in the same period a year earlier. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, May 5, 1965.)



## Faroe Islands

EXPORTS OF FROZEN  
FISH FILLETS, 1963-1964:

Faroeese exports of frozen fish fillets in 1964 were down 14 percent in quantity and 4 percent in value from the previous year. Shipments to the United States, which is the leading market, totaled 807 metric tons in 1964, down only 50 tons from the previous year. But shipments in 1964 were down sharply to East Germany and there were no exports to Hungary (which took 149 tons in the previous year). The decline was partly offset by higher

## Faroe Islands (Contd.):

Faroe Exports of Frozen Fish Fillets, 1963-1964						
Country of Destination	1964			1963		
	Quantity	Value		Quantity	Value	
	Metric Tons	Kr.	US\$	Metric Tons	Kr.	US\$
Denmark . . . .	16	56	8.1	17	48	7.0
United States . .	807	2,893	419.2	857	2,783	403.3
United Kingdom .	454	1,345	194.9	322	892	129.3
East Germany . .	158	334	48.4	485	1,025	148.5
Hungary . . . . .	-	-	-	149	304	44.0
Czechoslovakia .	324	641	92.9	209	433	62.8
Total . . . . .	1,759	5,269	763.5	2,039	5,485	794.9

Note: Kroner 6.9 equal US\$1.00.

exports to the United Kingdom and Czechoslovakia. (Faroes in Figures, No. 29 March 1965.)



## Iceland

## EXPORT STOCKS OF PRINCIPAL FISHERY PRODUCTS, MARCH 31, 1965:

Iceland's stocks of frozen groundfish (fillets) for export to the United States totaled 5,156 metric tons as of March 31, 1965 (see table).

Icelandic Export Stocks <sup>1</sup> of Principal Fishery Products, March 31, 1965			
Item	Quantity	Value	
	Metric Tons	Million Kr.	US\$ 1,000
<b>Groundfish, frozen:</b>			
For export to:			
U. S. . . . .	5,156	113.4	2,633.5
Other countries . . . . .	2,926	50.6	1,175.1
Stockfish . . . . .	4,420	123.8	2,875.0
<b>Herring:</b>			
Salted . . . . .	2/	2.9	67.3
Frozen . . . . .	5,132	29.3	680.4
<b>Industrial products:</b>			
Fish meal:			
Herring . . . . .	3,435	24.7	573.6
Other fish . . . . .	8,013	34.8	808.2
Herring oil . . . . .	17,871	148.3	3,444.0

<sup>1</sup>Includes only stocks intended for export.<sup>2</sup>/Not available.

Note: Icelandic kronur 43.06 equal US\$1.00.

United States imports of frozen groundfish fillets from Iceland in the year 1964 totaled 17,812 metric tons of groundfish blocks and slabs, 4,669 metric tons of cod fillets, 2,791 metric tons of haddock fillets, and 548 metric tons of ocean perch fillets. (United States Embassy, Reykjavik, April 28, 1965.)

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## EXPORTS OF FISHERY PRODUCTS, JANUARY-FEBRUARY 1965:

During January-February 1965, there was an increase in exports of dried salted fish, salted fish fillets, stockfish, canned fish, cod-liver oil, and herring oil, as compared with the same period in 1964, according to the Icelandic periodical Hagtidindi, March 1965. Ex-

Icelandic Fishery Exports, January-February 1965 with Comparisons						
Product	Jan.-Feb. 1965			Jan.-Feb. 1964		
	Qty.	Value f.o.b.		Qty.	Value f.o.b.	
	Metric Tons	1,000 Kr.	US\$ 1,000	Metric Tons	1,000 Kr.	US\$ 1,000
Salted fish, dried	1,066	21,913	508	507	12,829	298
Salted fish, uncured	867	14,462	336	961	14,491	336
Salted fish fillets	297	5,772	134	161	2,075	48
Wings, salted	44	600	14	105	1,431	33
Stockfish	2,089	60,811	1,411	1,641	47,005	1,091
Herring on ice	-	-	-	-	-	-
Other fish on ice	6,905	42,641	989	6,672	40,840	947
Herring, frozen	5,880	37,640	873	6,743	40,434	938
Other frozen fish, whole	1,259	14,522	337	758	7,837	182
Frozen fish fillets	2,166	48,774	1,132	7,015	154,180	3,577
Shrimp and lobster, frozen	73	6,523	151	114	11,165	259
Roes, frozen	183	2,825	66	44	1,054	24
Canned fish	76	3,964	92	40	1,849	43
Cod-liver oil	1,047	11,555	268	737	7,201	167
Lumpfish roes, salted	-	-	-	1	27	1
Other roes for food, salted	-	-	-	1	18	-
Roes for bait, salted	-	-	-	-	-	-
Herring, salted	5,006	53,765	1,247	6,315	67,046	1,555
Herring oil	3,931	31,902	740	3,576	28,489	661
Ocean perch oil	-	-	-	28	188	4
Whale oil	774	6,698	155	2,101	18,675	433
Fish meal	754	4,878	113	3,620	19,004	441
Herring meal	14,823	101,935	2,365	16,821	93,483	2,169
Ocean perch meal	-	-	-	-	-	-
Wastes of fish, frozen	597	1,881	44	197	534	12
Liver meal	94	666	15	100	658	15
Lobster and shrimp meal	25	124	3	87	346	8
Whale meal	311	1,889	44	630	3,514	82
Whale meat, frozen	10	80	2	43	331	8

Note: Values converted at rate of 1 krona equal to 2.32 U. S. cents.

Note: Values converted at rate of 1 krona equal 2.32 U. S. cents.

ports of frozen herring, frozen fish fillets, salted herring, whale oil, fish meal, herring meal, and whale meal showed a considerable decrease in the first 2 months of 1965.

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## TRAWLER FLEET CONTINUES TO DECLINE:

The Icelandic trawler fleet continued to decline in 1964. The operating fleet of 30 trawlers during the year accounted for only 63,000 metric tons of fish and represented 6.5 percent of Iceland's 1964 total fishery catch. By comparison, the trawling fleet in 1963 consisted of 37 operating vessels which caught 71,800 tons of fish or 9.2 percent of that year's total Icelandic catch. The 1963-64 record is in sharp contrast to 1954 when the 51 vessels in the trawler fleet caught 166,901 tons of fish and accounted for 43.1 percent of the total catch.

At the beginning of 1965 the Icelandic trawler fleet consisted of 39 vessels with a total

## Iceland (Contd.):



Fig. 1 - Small fishing craft in foreground and a small trawler on far side of wharf at Reykjavik.

gross tonnage of 27,395 tons, of which 30 vessels were in operation and the remaining 9 vessels were moored in Icelandic harbors (6 of them were advertised for sale). Three trawlers were removed from the fleet during 1964 and sold to Greek interests at a reported price of \$100,000 each. A fourth trawler was sold to the Faroe Islands but it was returned when an import license could not be obtained.

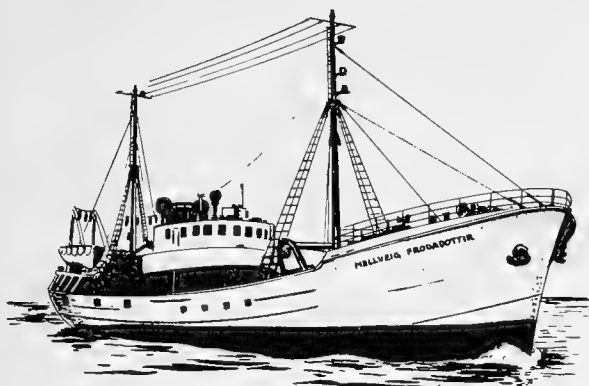


Fig. 2 - One of a number of trawlers built in Great Britain for Iceland in 1948.

Iceland's existing operating trawler fleet consists largely of vessels in the 700-ton class built during 1945-48, with only 4 trawlers in the 1,000-ton class built since 1960. The smaller capacity of the older trawlers (about 300-ton capacity as against 500 tons) reduces their operating efficiency along with the Icelandic legal requirement that trawlers be manned by a crew of 28 to 32. British trawlers, which often fish just outside the Icelandic fisheries limits, normally have a crew of 20 and West German trawlers a crew of 24.

Icelandic trawler owners claim that the economic recovery of the trawler fleet will depend on a reduction of the crew size and permission to fish within the 12-mile fishing limit, an area barred to them since 1958. (United States Embassy, Reykjavik, May 4, 1965.)



## Italy

## MARINE OIL FOREIGN TRADE, 1963-1964:

Italy's foreign trade in marine oils in 1963 and 1964 consisted almost entirely of incoming shipments as exports were insignificant. Italian imports of marine oils (other than liver oils) in 1964 were down about 5 percent from the previous year due mainly to lower shipments from Norway and Morocco. The decline was partly offset by a sharp gain in shipments from the Netherlands as well as by increases from South Africa, Canada, Peru, and Australia.

Italy's Foreign Trade in Marine Oils, 1963-1964				
Commodity and Country of Destination	Imports		Exports	
	1964	1963	1964	1963
... (Metric Tons) ...				
<u>Marine oils (other than liver oils):</u>				
France . . . . .	642	1,079	-	-
West Germany . . . . .	184	116	-	-
Norway . . . . .	2,818	4,432	-	-
Netherlands . . . . .	2,021	626	-	-
Portugal . . . . .	539	706	-	-
United Kingdom . . . . .	173	255	-	-
Morocco . . . . .	1,119	1,947	-	-
South Africa . . . . .	369	6	-	-
Canada . . . . .	805	297	-	-
Peru . . . . .	500	114	-	-
United States . . . . .	12	163	-	-
Australia . . . . .	151	-	-	-
Other countries . . . . .	55	121	15	17
Total marine oils (other than liver oils) . . . .	9,388	9,862	15	17
<u>Marine liver oils:</u>				
Finland . . . . .	-	19	-	-
France . . . . .	-	43	-	-
West Germany . . . . .	73	58	-	-
Iceland . . . . .	128	22	-	-
Norway . . . . .	536	607	-	-
Portugal . . . . .	184	491	-	-
United Kingdom . . . . .	410	198	-	-
Others . . . . .	35	40	4	1
Total marine liver oils . . . .	1,366	1,478	4	1

Italian imports of liver oils also showed a modest decline in 1964. (Agricultural Attache United States Embassy, Rome, April 22, 1965.)

Note: See Commercial Fisheries Review, Oct. 1964, p. 60.



## Ivory Coast

### CANNED SARDINE AND TUNA PRODUCTION PLANS FOR 1965/66 SEASON:

After 6 months of research and experimental packing, a cannery in Abidjan has announced plans for commercial production of canned sardines, using the Gulf of Guinea *Sardinella* stocks (both *S. eba* and *S. aurita*). The company plans a tuna and sardine pack during the 1965/66 season (starting in early August) totaling 30,000 cases of 100 "1/4 club" cans (122 grams or 4.3 ounces net). That pack is to include 2 million cans of sardine fillets in tomato sauce or soya oil and 1 million cans of flake tuna.

The company has learned through market research in the Ivory Coast that flake tuna in the "1/4 club" can sells much better than the "1/10" pack of the same product, and can now be offered to the consumer at the same price as a can of sardine fillets--40 CFA francs (about 16 U. S. cents).

The Abidjan cannery has announced tentative prices at various market levels as follows:

Pricing Point	Price Per "1/4" Can			
	Fillet of Sardines in Oil or Tomato Sauce		Flake Tuna in Oil or Tomato Sauce	
	CFA Francs	U.S. Cents	CFA Francs	U.S. Cents
To distributors . . . .	32	12.9	33	13.4
To wholesalers . . . .	35	14.2	36	14.6
Retail . . . . .	40	16.2	40	16.2
For export (tax exempt)	24.6	10.0	25.4	10.3

In recent years, Ivory Coast imports of Moroccan sardines have been about 6 million cans annually. Since the expanded pack of the Abidjan cannery will probably be distributed mainly within the Ivory Coast, imports from Morocco could be cut almost in half during 1965/66, with a more drastic cut possible in later years. (United States Regional Fisheries Attache for Africa, United States Embassy, Abidjan, April 24, 1965.)

Notes: (1) CFA francs 247 equal US\$1.00.

(2) See Commercial Fisheries Review, March 1965 p. 75 and Feb. 1965 p. 83.



## Japan

### SUMMER ALBACORE TUNA FISHERY AND EXPORT PRICE TRENDS:

The summer albacore fishery off Japan was off to a good start as of April 1965. Some 200-300 metric tons were landed daily at Yaizu and Shimizu and as of late April over 4,000 tons had been landed. Ex-vessel prices were 123-125 yen a kilogram (US\$310-315 a short ton) for large albacore (over 33 lbs.) and 110-118 yen a kilogram (\$277-297 a short ton) for smaller (25-lb.) fish. Most of the large fish was purchased by packers for canning.

The price of frozen round albacore exported to the United States from Japan proper was \$365-370 a short ton c.&f. in late April, with the market firm.

The export market for yellowfin tuna is said to have firmed in late April, with prices up \$5-10 a short ton since early April. Frozen yellowfin (gilled and gutted) exported to the United States from Japan proper were \$365 a short ton c.&f. The Japanese domestic ex-vessel price for yellowfin from the Indian Ocean was reported to be about 112 yen a kilogram (\$282 a short ton). Buying for the export trade was brisk. (Suisan Tsushin, April 28, 1965.)

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### TUNA INDUSTRY TO ESTABLISH COUNCIL TO REGULATE ATLANTIC ALBACORE TUNA EXPORT TRADE:

The Japan Export Frozen Tuna Producers Association's Atlantic Ocean Tuna Committee convened a meeting in early May to seek ways and means of stabilizing the export of Atlantic-caught albacore tuna. At that meeting, the Committee decide to establish a liaison council, representing the Export Frozen Tuna Producers Association, the National Federation of Tuna Fishermen's Cooperative Associations (NIKKATSUREN), and the Japan Frozen Foods Exporters Association, to develop means of stabilizing the Atlantic albacore trade. Principal functions of the council will be to:

1. Develop and implement an annual export plan. To stabilize albacore exports, the council will develop a seasonal and regional supply plan based on market conditions.

2. Establish stable export prices. Based on minimum export prices to be set by the



## Japan (Contd.):

Export Frozen Tuna Producers Association, the council will establish proper sales prices to avoid undue competition among Japanese trading firms and to prevent foreign buyers from beating down prices.

3. Adjust differences in freight costs. In view of differences in freight costs from point of shipment to point of destination, the council will make adjustments so as to enable foreign countries to import albacore under generally similar conditions.

Also at the same meeting, the Committee established the following tentative export targets for Atlantic albacore (based on estimated landings of 48,000 short tons a year): 30,000 tons to U. S. packers in Puerto Rico; 10,000 tons to U. S. packers on the Pacific Coast; and 8,000 tons to Italy, Yugoslavia, and other European countries. However, those targets are expected to be examined in greater detail for development of a monthly supply plan. (Nihon Suisan Shimbun, May 3, 1965.)

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#### TUNA FEDERATION DEVELOPS PLAN TO STABILIZE FROZEN ALBACORE TUNA EXPORT MARKET:

The Japan Federation of Tuna Fishermen's Cooperative Associations (NIKKATSUREN) for some months has been developing a master plan to reorganize the tuna fishing fleet in an effort to overcome the economic difficulties facing its membership. At a directors meeting in April 1965 the plan and measures to stabilize export tuna prices were reviewed. The meeting adopted a plan whereby NIKKATSUREN would act as sole purchasing agent for all ship-frozen albacore tuna landed in Japan, including surplus Atlantic-caught albacore transshipped to Japan, which it would market in Japan for domestic consumption. NIKKATSUREN estimates the oversupply of Japanese-caught albacore to amount to 20,000-25,000 metric tons a year, but believes that a good potential demand for albacore exists in Japan and hopes to develop it as a means of disposing of the oversupply.

Under NIKKATSUREN's plan, frozen albacore for export would be supplied primarily from the Atlantic and Indian Ocean fisheries and from the mothership and overseas-based fisheries. For example, Japanese albacore exports to California would be transshipped

from the Atlantic Ocean rather than shipped from Japan proper. The additional cost of transportation would be shared equally by the fishermen. On the other hand, pole-caught summer albacore would be primarily delivered to domestic packers and ship-frozen albacore supplied to new domestic markets to be developed by NIKKATSUREN.

On April 30, NIKKATSUREN met with the Frozen Foods Exporters Association to explain the gist of its plan to stabilize the albacore market. It was reported that the Japanese trading firms basically supported NIKKATSUREN's albacore redistribution plan, but felt that the trade in Atlantic-caught albacore must first be stabilized in order to stabilize the domestic and export albacore market, and that in this context some kind of control must first be imposed on the flow of Atlantic caught tuna. Further, NIKKATSUREN's plan to control the marketing of ship-frozen albacore landed in Japan may well force up ex-vessel prices for pole-caught albacore, which under NIKKATSUREN's plan would be sold to Japanese packers. (Suisan Tsushin, May 4; Minato Shimbun, April 28, 1965.)

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#### THIRD CANNED TUNA IN BRINE SALE TO UNITED STATES:

The Tokyo Canned Tuna Sales Company offered for the third sale of canned tuna in brine for export to the United States a total of 350,000 cases, consisting of 280,000 cases of white meat tuna and 70,000 cases of lightmeat tuna. Shipping period was May-June 1965. Base prices were US\$9.50 a case for solid white and \$7.35 a case for solid light. For the first two sales, the Sales Company offered for export a total of 400,000 cases (300,000 cases of whitemeat and 100,000 cases of lightmeat). (Kansume Nippo, May 15, 1965, and other sources.)

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#### CANNED TUNA PACK TRENDS:

The packing in Japan of canned tuna in brine for export is proceeding at a smooth pace. Some packers by early May 1965 had met their pack quota for the first quarter (April-June). The somewhat accelerated production pace is attributed to several factors: short supply in April and early May of other items to pack (such as mackerel, bamboo sprouts, and beans) and a comparatively abundant supply of tuna available at not too

## Japan (Contd.):

high prices. Packers are reported to be paying 110-115 yen a kilogram (US\$277-290 a short ton) for albacore and 67-70 yen a kilogram (\$169-176 a short ton) for skipjack.



Interior view of tuna canning plant in Japan.

On the other hand, the pack of canned tuna in oil for export is proceeding at a slow pace. Tuna packed in oil are mainly Indian bluefin quoted at 80 yen a kilogram (\$202 a short ton) and skipjack at 70 yen a kilogram (\$176 a short ton).

Price of the oil pack (mainly for export to Europe) as of early May was around 2,330 yen (\$6.47) a case (48 7-oz. cans) and 1,330 yen (\$3.69) a case (48 3.5-oz. cans). Packers are reported unable to show a profit at those low prices, which are attributed to the practice of some cannery selling their pack even at a loss. (Kanzume Nippo, May 7, 1965.)

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#### CANNED TUNA SHIPMENTS FROM SHIMIZU, MARCH 1965:

Shipments of canned tuna products made by vessel from Shimizu in March 1965 totaled 430,070 actual cases--250,638 cases to the United States and Canada, 164,789 cases to Europe, and 14,643 cases to other countries. For January-March 1965, a total of 743,248 cases had been shipped from Shimizu. (Kanzume Nippo, May 15, 1965.)

\* \* \* \* \*

#### CANNED TUNA IN BRINE EXPORT SALES DEVELOPMENTS:

The Japanese Tuna Packers Association and the Canned Foods Exporters Association in early April 1965 agreed to the 1965 Exporters Agreement governing the export of canned tuna in brine to the United States. The agreement provides that 70 percent of the canned tuna in brine export pack will be allocated to exporters on the basis of their past performance records and 30 percent to

be set aside as an adjustment quota. Thus, the Packers Association decided to make available for sale between April-May a total of 400,000 cases (300,000 cases of whitemeat tuna and 100,000 cases of lightmeat tuna), and for the first sale offered 280,000 cases, representing the 70-percent past performance quota.

For the second sale, conducted in early May, the Packers Association offered 120,000 cases, representing the remaining 30-percent adjustment quota (of the original 400,000 cases). Reportedly, the 18 authorized exporting firms submitted offers to purchase a total of 207,773 cases but the Association is only releasing 120,000 cases. This action on the part of the packers is being criticized as being unreasonable at this time when they should be most willing to sell as much as possible, but it is reported that the decision for not offering the full amount requested by the exporters may possibly be based on some kind of understanding with the exporters. (Suisan Tsushin, May 8; Kanzume Nippo, May 8, 1965.)

Note: See Commercial Fisheries Review, July 1965 p. 104; June 1965 p. 72; May 1965 p. 71.

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#### EXPORTS OF CANNED TUNA IN OIL AND SPECIALTY PACKS, FISCAL YEAR 1964:

Japanese canned tuna in oil approved for export in fiscal year 1964 (April 1964-March 1965) totaled 1,989,004 cases, according to data compiled by the Japan Canned Tuna Packers Association. This was a 33-percent increase over fiscal year 1963 exports and 23.3 percent more than exports in 1962.

Table 1 - Japanese Exports of Canned Tuna in Oil, Fiscal Year 1964 with Comparisons			
Product	FY 1964	FY 1963	FY 1962
	. . . . (No. of Actual Cases). . . .		
Albacore . . . . .	388,585	381,246	387,537
Yellowfin . . . . .	19,517	98,365	45,663
Big-eyed . . . . .	595,364	945,294	526,915
Skipjack . . . . .	984,778	498,990	652,357
Tuna flakes . . . . .	760	900	930
Total . . . . .	1,989,004	1,924,795	1,613,402

The principal countries of destination for Japan's exports of canned tuna in oil were: West Germany 785,564 cases; Canada 242,792; Great Britain 191,297; Switzerland 139,124; and the Netherlands 108,985 cases.

Japanese canned tuna other than in oil or brine approved for export in fiscal year 1964 totaled 678,224 cases, nearly 50 percent more than the quantity exported in fiscal year 1963.

## Japan (Contd.):

Table 2 - Japanese Exports of Canned Tuna Other Than in Oil, Fiscal Year 1964 with Comparisons			
Product	FY 1964	FY 1963	FY 1962
	..... (No. of Actual Cases) .....		
Jelly tuna . . . . .	72,064	42,736	95,598
Vegetable tuna . . . .	575,583	362,674	328,140
Tuna in tomato sauce	193	17,976	14,168
Tuna flake in soy sauce	20,080	4,600	Unknown
Tenderized tuna . . . .	2,700	Unknown	"
Other types . . . . .	7,604	10,910	7,446
Total . . . . .	678,224	438,896	445,352

Japan's exports of canned pet food in fiscal year 1964 totaled 841,983 cases, consisting of 823,278 cases of  $\frac{1}{2}$ -lb. 48's and 18,705 cases of 1-lb. tall 24's. (Suisan Tsushin, April 19; Kanzume Nippo, April 15 & 16, 1965.)

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#### TUNA INDUSTRY STATUS DISCUSSED AT GOVERNMENT-INDUSTRY MEETINGS:

The Japanese Fisheries Agency has scheduled a series of Government-industry discussion meetings for 1965 to seek ways and means of strengthening the tuna industry which, despite its dominant position in the Japanese fisheries, has been experiencing management difficulties. The Agency plans to hold a total of 7 discussion meetings, beginning in mid-May and ending in November, to thoroughly explore the problems plaguing the tuna industry.

Topics to be discussed at the meetings include: (1) background and present status of the tuna fishery; (2) fisheries management; (3) tuna resources and status of research; (4) marketing; and (5) world tuna trends.

The Agency has already announced the names of the 17 members that will participate in the discussions. Four of the persons selected are Government officials and the others are all from industry. (Nihon Suisan Shimbun, April 28, Suisancho Nippo, April 26, 1965.)

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#### VERTICAL DISTRIBUTION OF ALBACORE TUNA INFLUENCED BY SECOND THERMOCLINE SAY JAPANESE SCIENTISTS:

A theory attributing the density of summer albacore tuna schools appearing off the coast of Japan to the effect of a thermocline at great depths (upwards to 400-500 meters or 1,312

to 1,640 feet) has been advanced by a scientist of the Tokai University's Fishery Research Laboratory at a seminar conducted several months ago in Tokyo by the Japan Scientific Society of Fisheries.

It is generally held that the vertical distribution of albacore is determined by water temperature conditions in the upper surface layers, as well as by current conditions, and that abundance in any given year is determined by the size of the run. The University scientist maintains that the summer albacore runs off Japan are generally uniform, except that in poor years the albacore are found in waters further to the east in deeper waters. He has successfully located such albacore schools at great depths by means of a new fish finder. He found albacore at depths of 400 meters, and some schools at those depths showed no signs of moving up to the surface for over a week. He concludes that the vertical movement of the albacore, which were caught when they moved to the surface, was presumably due to factors other than response to food stimuli.

The Japanese scientist examined oceanographic data compiled by the Hydrographic Division of the Japanese Maritime Safety Agency during the last 10 years and found that fishing conditions in the past appeared to show some relationship with the distribution pattern of a second thermocline. It is his theory that the vertical distribution of albacore tuna off Japan may be influenced not only by the water temperature in the upper surface layers but also by temperature and current conditions in the deeper depths. (Suisan Keizai Shimbun, April 15, 1965.)

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#### CANNED FOOD EXPORT TARGETS, FISCAL YEAR 1965:

The Canned Foods Committee of the Japanese Ministry of International Trade and Industry's Agricultural and Marine Products Export Council held a meeting April 20, 1965, to set the fiscal year 1965 (April 1965-March 1966) canned foods export target and to develop recommendations for their attainment. The export target established by the Committee totaled 19,367,000 cases of canned food products valued at US\$168,991,000, an increase of 6.7 percent in quantity and 0.9 percent in value over the 1964 exports. The Committee adopted the following recommendations:

## Japan (Contd.):

1. The Government should develop measures to ensure procurement of raw materials by packers. For that purpose, the Government should exercise a greater degree of administrative leadership to facilitate collective bargaining between suppliers and packers, and to encourage suppliers to speed up delivery of raw material.

2. Canned prices should be reduced.

3. The Government should relax loan requirements by establishing a system whereby sales companies may advance loans to packers under terms similar to those granted by financial institutions to exporters and also permit higher ceilings on long-term low-interest improvement loans.

4. The Government should conduct more positive economic negotiations with foreign countries to increase canned food exports. For that purpose, it should: (a) Seek to have the United States reduce as follows the ad valorem import duties on the following fishery products: canned tuna in oil, from 35 percent to 12.5 percent, the rate presently applied to canned tuna in brine imports; canned crab meat, from 22.5 percent to 11.5 percent; and canned clams, to 10 percent. (b) Seek to have the United States abolish the tariff quota on canned tuna in brine imports. (c) Include canned sardines, mackerel, saury, squid, and salmon (particularly pink) in the items of reparations goods to be delivered to the Philippines and Indonesia. (d) Seek to increase the import quotas set by southeast Asian countries, especially Indonesia and Malaysia, on canned saury and mackerel. (e) Forestall movements in foreign countries aimed at restricting imports of Japanese products. (f) Prohibit exports of products on which substantially high tariffs would be imposed through application of the European Economic Community (EEC) common tariff and seek to reduce EEC common tariffs.

5. Study ways of promoting exports of products which meet export specifications.

6. Step up promotional activities abroad and increase Government subsidy to cover expenses required for marketing research to promote demand.

7. Apply the existing sugar export rebate system to all canned food exports and simplify rebate procedure.

8. Grant favorable treatment in assessing charges for public-operated services, such as railway transportation, and establish special

Japanese Canned Foods Export Targets for FY 1964 with Comparisons				
Product	Quantity		Value	
	FY 1965	FY 1964	FY 1965	FY 1964
	.. (1,000 Cases) ..		.. (US\$1,000) ..	
Tuna . . . . .	5,000	4,565	38,863	37,002
Salmon . . . . .	1,230	1,365	41,624	45,703
Crab meat . . .	511	554	12,658	13,118
Sardine . . . . .	110	44	782	356
Saury . . . . .	1,200	1,090	7,464	6,684
Mackerel . . . .	1,010	881	6,310	5,825
Other fishery products . . . .	3,136	3,014	19,415	19,192
Pet food . . . .	1,100	1,014	3,520	3,275
Other food products . . .	6,070	5,616	38,355	36,195
Total . . . .	19,367	18,143	168,991	167,350

domestic transportation arrangements for seasonal shipments of export canned food products. (Suisan Keizai Shimbun, April 2; Suisan Tsushin, April 22, 1965.)

Note: See Commercial Fisheries Review, June 1964 p. 45.

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#### SALMON PRICE NEGOTIATIONS:

The Japan Federation of Salmon Fishermen's Associations (NIKKEIREN) in April was negotiating 1965 salmon prices with the Japanese firms operating motherships. On April 16, 1965, NIKKEIREN asked for a 30-percent increase over 1964 prices, claiming that its asking prices were calculated on the basis of what it would cost to build and operate a typical steel salmon vessel of 96 gross tons (normally costs 53 million yen or US\$147,000 to build), plus what the Federation considered a reasonable profit (10 percent). The mothership operators claimed they could not possibly accept the Federation's offer and on April 22 countered with an offer amounting to less than a 1 percent increase.

On April 24, NIKKEIREN lowered its demand and asked for an overall increase of 20 percent over 1964 prices. The mothership operators countered with an offer of a 3-percent increase. (Suisan Keizai Shimbun, April 23 & 27, 1965.)

\* \* \* \* \*

#### SETTLEMENT REACHED ON 1965 SALMON EX-VESSEL PRICES:

On May 7, 1965, following several weeks of negotiations, the Japan Federation of Salmon

## Japan (Contd.):

on Fishermen's Associations (NIKKEIREN) and the salmon mothership operators reached agreement on the following 1965 salmon ex-vessel prices:

Species	1965 Price		1964 Price
	Yen/Kg.	Cents/Lb.	Cents/Lb.
Red . . . . .	243.26	30.7	27.4
Chum . . . . .	131.82	16.6	14.9
Pink . . . . .	106.60	13.4	11.9
King & silver	143.81	18.1	16.2

Prices agreed upon represent a uniform 12-percent increase over 1964 prices. The negotiations began with NIKKEIREN asking for a 30-percent increase, and the mothership operators countering with an offer amounting to less than a one-percent increase. (Suisan Keizai Shimbun, May 9, 1965.)

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#### SALMON MOTHERSHIP FLEET COMPOSITION AND CATCH QUOTA FOR 1965:

A total of 11 Japanese motherships accompanied by 369 catcher vessels (same as in 1964) will participate in Japan's 1965 high-seas salmon fishery. The mothership fleets will have a total complement of 12,048 men. The 11 fleets were scheduled to leave Japan for the salmon fishing grounds in the North Pacific and Bering Sea on May 15, 1965. Their combined catch quota is 45,478 met-



Retrieving a gill net and removing salmon aboard a Japanese gill-netter in the North Pacific.

#### Japanese Salmon Mothership Fleet Composition in 1965

Name	Vessel Size	Processing Equipment		Catcher Vessels	Crew Complement	
		Canning Lines	Daily Freezing Capacity		Mother- ship	Catcher Vessels
	<u>Gross Tons</u>		<u>Tons</u>	<u>No.</u>		
Shinano Maru . . . . .	9,048	3	50	35	479	770
Meisei Maru No. 2 . .	9,356	3	Unknown	36	453	792
Meisei Maru . . . . .	8,571	3	50	35	459	770
Kizan Maru . . . . .	8,622	3	20	33	449	726
Miyajima Maru . . . .	9,612	2	200	30	328	638
Takashima Maru . . .	9,856	3	300	29	362	635
Chiyo Maru . . . . .	7,149	2	150	36	320	729
Jinyo Maru . . . . .	7,161	3	150	36	330	730
Meiyo Maru . . . . .	7,152	3	200	36	350	720
Otsu Maru . . . . .	8,033	3	210	31	330	630
Kyokusan Maru . . . .	10,757	2	150	32	344	704
Total . . . . .	95,317	30		369	4,204	7,844

## Japan (Contd.):

ric tons as compared with 55,000 tons in 1964. (Suisancho Nippo, April 17, 1965; Hokkai Shimbun, May 10, 1965.)

Note: See Commercial Fisheries Review, July 1964 p. 62.

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### **SALMON MOTHERSHIP CANNED PACK TO BE TRANSSHIPPED DIRECTLY TO GREAT BRITAIN:**

Two Japanese firms operating salmon motherships in the North Pacific and Bering Sea are planning on transshipping their factoryship-produced salmon pack directly from the fishing grounds to Great Britain in 1965. By doing so, it is estimated that it will take about 35 days for shipments to reach their destination and cut down shipping time by 30 days. Under the old system whereby the canned pack was hauled to Japan by carrier vessels, unloaded, inspected, and reshipped, it took a minimum of 65 days. (Suisan Tsushin, May 14, 1965.)

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### **EXPORTS OF CANNED CRAB MEAT, JANUARY-MARCH 1964-65:**

Japanese exports of canned crab meat in the first quarter of 1965 totaled 108,082 cases (48  $\frac{1}{2}$ -lb. cans), down 3.5 percent from the 111,979 cases exported in the same period of 1964. King crab accounted for about 94 percent of all crab meat exported. The remainder was from kegani, hanasaki, and zuwai crab.

Japanese Exports of Canned Crab Meat by Country, January-March 1964-65					
1965	United States	United Kingdom	France	Other	Total
. . . (No. of cases of 48 1/2-lb. cans) . . .					
Month:					
January	9,643	3,150	8,015	3,807	24,615
February	19,420	2,144	5,598	5,556	32,718
March	26,000	19,065	3,310	2,374	50,749
Total 1st Qtr. 1965	55,063	24,359	16,923	11,737	108,082
1964					
Month:					
January	12,351	13,795	3,400	3,566	33,112
February	17,067	17,465	4,027	4,962	43,521
March	26,224	3,456	3,875	1,791	35,346
Total 1st Qtr. 1964	55,642	34,716	11,302	10,319	111,979

Source: Japan Canned Crab Sales Co.



Packing canned crab meat into cartons aboard a Japanese factory-ship in the North Pacific.

The United States and the United Kingdom are the leading markets for Japan's crab meat exports. The United States took 50.9 percent of Japan's first quarter 1965 exports, and 22.5 percent went to the United Kingdom. France was the next leading purchaser. (Fisheries Attache, United States Embassy, Tokyo, April 30, 1965.)

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### **CANNED KING CRAB EXPORT PRICES INCREASED:**

The Japan Canned Crab Sales Company as of May 1965 increased the canned king crab export price (f.o.b. Japan) of fancy  $\frac{1}{2}$ -pound 48's to US\$28.40 a case from \$28.15, and fancy  $\frac{1}{4}$ -pound 48's to \$17.15 a case from \$16.90. (Minato Shimbun, May 16, 1965.)

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### **CRAB ENTERPRISE IN CHILE DELAYED:**

Two Japanese fishing companies and a trading firm formed a group called the "Chile Committee" to establish a joint Japanese-Chilean venture. The Committee had hoped to begin by establishing a centolla crab enterprise in Chile and in late 1964 one of the Japanese fishing firms cooperated with Chile in surveying the crab resources of that country. It is now reported that the Committee has temporarily held up its plans to establish a joint enterprise in Chile as it has not yet found a suitable undertaking that the joint company, if established, could engage in other than crab fishing, the season for which is reported short. (Suisancho Nippo, May 15, 1965.)

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## Japan (Contd.):

CANNED SHRIMP EXPORTS, MARCH 1965:

Japan's exports of canned shrimp in March 1965 amounted to 11,032 cases (converted to 24 1/2-lb. cans), a decrease of 63 percent from the total exported during the same month in 1964. The March 1965 exports of canned shrimp were down 2,526 cases or 18.6 percent from February 1965.

facilities to process minced fish meat, which is used to manufacture fish sausage and fish cake. Alaska pollock will be used. Two other major fishing firms are said to be showing active interest in entering this type of venture. (Suisan Keizai Shimbun, April 21, 1965.)

The Japanese fish-meal factoryship Hoyo Maru (14,111 tons), accompanied by 29 catcher vessels, departed Hakodate, Hokkaido, on

Japan's Exports of Canned Shrimp by Country of Destination, March 1965

No. Cans Per Case	Size	U.S.	Great Britain	Canada	Other Countries	Total
. . . . . (No. of Actual Cases). . . . .						
24 1/2-lb.	Small	1,666	4,968	-	404	7,038
48 1/4-lb.	"	-	9	-	-	9
24 1/2-lb.	Tiny	-	-	-	511	511
48 1/4-lb.	"	-	43	-	-	43
24 1/2-lb.	Broken	3,411	-	-	-	3,411
48 1/4-lb.	"	-	20	-	-	20
. . . (No. of Standard Cases of 24 1/2-lb. Cans) . . .						
Total March 1965		5,077	5,040	-	915	11,032
Exports March 1964		14,262	9,243	2,900	3,087	29,492

Note: Size of can indicates total weight of contents in can.

Source: Japan Canned Crab Sales Co. (Sales agent for canned shrimp.)

The United States and Great Britain purchased the bulk of Japanese canned shrimp exported in March, about equally divided between the two countries. (Fisheries Attache, United States Embassy, Tokyo, May 4, 1965.)

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FISHING PLANS IN BERING SEA:

The Japanese fish-meal factoryship Tenyo Maru (11,581 gross tons) departed Yokohama, Japan, on April 20, 1965, for the eastern Bering Sea where she is scheduled to operate until the end of September. Her production target is 5,000 metric tons of minced meat and 3,000 tons of fish meal. Tenyo Maru is the first Japanese factoryship to be equipped with



Fig. 1 - Japanese trawler attached to fish meal factoryship Tenyo Maru.

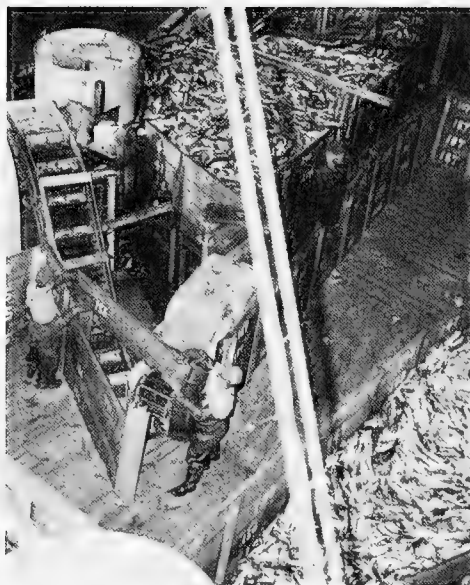


Fig. 2 - Fish meal factoryship Tenyo Maru--port side of main deck forward of deckhouse.

## Japan (Contd.):

April 22 for the eastern Bering Sea. Scheduled to operate in Bering Sea bottomfish grounds until September 21, she has a production target of 13,500 metric tons of fish meal, 2,900 tons of fish solubles, 1,300 tons of oil, and 4,800 tons of frozen fish. (Suisan Tsushin, April 23, 1965.)

The factoryship Seifu Maru (8,269 gross tons) was scheduled to depart for the waters off Cape Olyutorski in the Bering Sea about May 15 to fish primarily for herring.



Fig. 3 - King crab factoryship Tokei Maru.

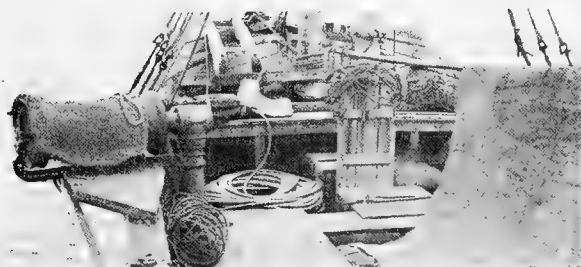


Fig. 4 - Hoisting gear in bow of trawler attached to factoryship Tokei Maru.

The two Japanese king crab factoryships operating in Bristol Bay were doing well and averaging 10.1 crabs per shackle as compared to 10 crabs per shackle last year. As of April 25, the Tainichi Maru (5,858 gross tons) had produced 22,113 cases as compared to 18,769 cases for the same period last year, and the Tokei Maru (5,385 gross tons) 23,730 cases as compared to 21,827 cases a year ago. (Suisan Tsushin, April 27, 1965.)

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#### PLANS TO PRODUCE MINCED FISH ABOARD FACTORYSHIPS OPPOSED BY LAND-BASED PROCESSORS:

Minced fish processors and local fishermen in Hokkaido were in an uproar over the plans of several large Japanese fishing firms

to produce factoryship-processed minced fish (used in the manufacture of fish cake and sausage). It was said that one of Japan's largest fishing companies plans to produce 5,000 metric tons of minced meat in its 1965 Bering Sea factoryship operations and another plans to produce 2,000 tons. The Hokkaido processors and fishermen contend that such factoryship processing would seriously jeopardize the local minced fish industry. They have petitioned their prefecture governor for support and were also planning to appeal to their Diet representatives to forestall such operations. In 1964, the Hokkaido processors reportedly produced about 20,000 tons of minced fish. (Nihon Suisan Shimbun, May 3, 1965.)

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#### FISH MEAL MARKET TRENDS, 1965:

The three major Japanese fishing firms which will be operating fish-meal factoryships in the Bering Sea in 1965, were planning to confer with each other over the establishment of a standard price for factoryship-produced fish meal before starting negotiations with livestock producers.

The demand for fish meal in Japan has increased greatly despite higher prices. In 1964, 105,000 metric tons of fish meal were imported by Japan and imports are expected to increase to 148,000 tons in 1965. The standard price per metric ton for fish meal in 1963 was 62,500 yen (US\$174), and in 1964, 60,500 yen (\$168). Fish-meal production from the Japan-Soviet joint fish-meal operation in the Okhotsk Sea in January-March 1965 was sold in Japan for 63,750 yen (\$177). The three Japanese companies were reported to be seeking at least 64,000 yen (\$178) for their summer 1965 fish-meal production. (Suisan-cho Nippo, May 7, 1965.)

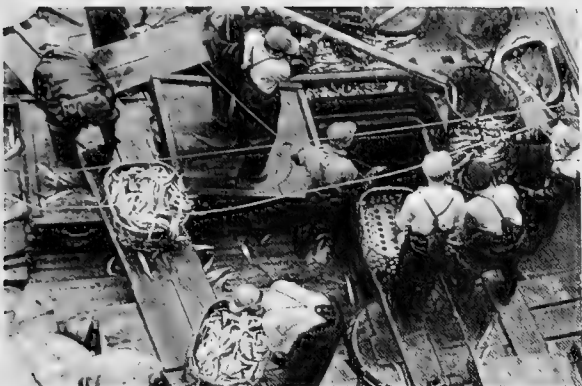
Note: See Commercial Fisheries Review, June 1965 p. 61.

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#### MACKEREL FISHING AND PRICE TRENDS AS OF EARLY MAY 1965:

Weather conditions which slowed Japanese mackerel fishing in April 1965 were reported improved in early May, and mackerel fishing off the Izu Peninsula (southwest of Tokyo) and off Choshi (east of Tokyo) picked up considerably since May 7. On that day, packers in the Yaizu area were reported paying high prices of 33-34 yen a kilogram (US\$83-86 a short ton) for  $\frac{3}{4}$ - to 1-lb. size fish. At Choshi, 1,000 metric tons of mackerel landed on May 7

## Japan (Contd.):



Washing mackerel prior to putting it in the vessel's fish hold.

brought 23-26 yen a kilogram (\$58-66 a short ton). On May 10, pole-caught mackerel sold for 30 yen a kilogram (\$76 a short ton), with seine-caught fish bringing about 20 yen a kilogram (\$50 a short ton). Choshi packers were reported actively buying fish. (Suisancho Nippo, May 10, 1965.)

Note: See Commercial Fisheries Review, June 1965 p. 61.

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### MARINE OIL SUPPLY AND DISPOSITION, 1963-1964 AND 1965 FORECAST:

Edible Marine Oil: The Japanese supply of edible marine oils in 1964 was down about

Table 1 - Japanese Supply and Disposition of Edible Marine Oils, 1963-1964 and 1965 Forecast

Item	Calendar Years		
	Forecast 1965	1964	1963
..(1,000 Metric Tons) ..			
<b>SUPPLY:</b>			
Opening Stocks, January 1:			
Fish oil and fish-liver oil . . .	7.7	9.9	18.5
Whale oil . . . . .	3.9	5.9	5.1
Total opening stocks . . . . .	11.6	15.8	23.6
<b>Production:</b>			
Whale oil . . . . .	99.1	109.1	127.0
Fish oil . . . . .	27.0	18.1	24.0
Fish-liver oil . . . . .	9.6	8.9	9.3
Total production . . . . .	135.7	136.1	160.3
<b>Imports . . . . .</b>	0.5	0.4	0.5
Total supply . . . . .	147.8	152.3	184.4
<b>DISPOSITION:</b>			
Exports . . . . .	84.0	82.8	119.3
Domestic disappearance . . . .	1/	1/	1/
1/Not available. (The Japanese Ministry of Agriculture and Forestry estimated that domestic food uses of marine oils in fiscal year 1965 amounted to 49,900 metric tons--17,000 tons whale oil and 32,900 tons fish oil--most of which was consumed in the manufacture of margarine and shortening. In addition 2,000 tons of fish oil was consumed for nonfood uses.)			

17 percent from the previous year due to lower production of both fish oil and whale oil. Fish oil output is expected to recover in 1965. Whale oil output, however, will probably continue at a reduced level as a result of Antarctic conservation measures.

Japanese imports of marine oil are small. In 1964, the imports consisted mainly of shark-liver oil.

With supplies reduced, Japanese exports of edible marine oil were down 31 percent in 1964 due mainly to lower whale oil shipments to the Netherlands. Whale oil accounts for most of Japanese exports of edible marine

Table 2 - Japanese Supply and Disposition of Inedible Marine Oil (Sperm Oil) 1/ 1963-1964 and 1965 forecast

Item	Calendar Years		
	Forecast 1965	1964	1963
.. (1,000 Metric Tons) ..			
<b>SUPPLY:</b>			
Opening stocks, January 1 <sup>2/</sup> . .	6.8	7.3	6.5
Production . . . . .	38.8	45.9	37.8
Imports . . . . .	-	-	-
Total supply . . . . .	45.6	53.2	44.3
<b>DISPOSITION:</b>			
Exports . . . . .	14.4	25.0	3/12.5
Domestic disappearance . . . .	4/	4/	4/
1/The Japanese supply of inedible marine oil consists of sperm oil.			
2/Stocks held by oil-processing factories.			
3/Estimated by the Japanese Ministry of Agriculture and Forestry.			
4/Data not available. (The Japanese Ministry of Agriculture and Forestry estimated that domestic use of sperm oil in fiscal year 1965 amounted to 24,400 tons.)			

Table 3 - Japanese Imports of Marine Oils, 1963-1964

Commodity and Country of Origin	1964	1963
.. (Metric Tons) ..		
<b>EDIBLE MARINE OIL:</b>		
Shark-liver oil:		
Republic of China . . . . .	38	76
Hong Kong . . . . .	53	19
Norway . . . . .	86	49
Spain . . . . .	120	-
Other countries . . . . .	27	5
Total shark-liver oil . . . .	324	149
Other fish-liver oils . . . . .	25	69
<b>Fish oil:</b>		
Peru . . . . .	-	271
South Africa Republic . . . .	-	1
Total fish oil . . . . .	-	272
<b>Whale oil:</b>		
United States . . . . .	2	10
Total edible marine oils . .	351	500
<b>INEDIBLE MARINE OIL:</b>		
Sperm oil:		
United States . . . . .	10	7
Source: Japanese Customs Bureau, Ministry of Finance.		

## Japan (Contd.):

Table 4 - Japanese Exports of Marine Oils, 1963-1964		
Commodity and Country of Destination	1964	1963
... (Metric Tons) ...		
<b>EDIBLE MARINE OIL:</b>		
Whale oil:		
Netherlands . . . . .	25,119	54,690
United Kingdom . . . . .	20,974	27,880
West Germany . . . . .	15,901	15,685
France . . . . .	13,111	13,564
Belgium . . . . .	5,463	5,080
North Korea . . . . .	130	226
United States . . . . .	9	-
Australia . . . . .	-	301
Total whale oil . . . . .	80,707	117,426
Fish oil:		
United States . . . . .	135	-
South Korea . . . . .	162	90
Other countries . . . . .	-	24
Total fish oil . . . . .	297	114
Cod-liver oil:		
United States . . . . .	617	748
Other countries . . . . .	362	314
Total cod-liver oil . . . . .	979	1,062
Shark-liver oil:		
All countries . . . . .	121	17
Unclassified fish-liver oils:		
United States . . . . .	225	293
Norway . . . . .	124	33
Other countries . . . . .	321	281
Total unclassified fish-liver oils	670	607
Unclassified edible marine oil . .	-	31
Total edible marine oil exports	82,774	119,257
<b>INEDIBLE MARINE OIL:</b>		
Sperm oil:		
United States . . . . .	6,633	7,532
Netherlands . . . . .	13,609	1/
United Kingdom . . . . .	2,540	3,853
France . . . . .	2,130	-
West Germany . . . . .	96	2,302
Other countries . . . . .	2	323
Total sperm exports . . . . .	25,010	1/

1/ Data not available.

Source: Japanese Customs Bureau, Ministry of Finance.

oil, and the leading buyers are the Netherlands, the United Kingdom, West Germany, and France.

**Inedible Marine Oil:** Japanese production of sperm oil increased in 1964, but is expected to decline in 1965. Complete data on Japanese exports of sperm oil is not available, although estimates indicate the exports increased in 1964. (Agricultural Attache, United States Embassy, Tokyo, April 21, 1965.)

Note: See Commercial Fisheries Review, Aug. 1964 p. 74.

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#### WHALING OPERATIONS IN NORTH PACIFIC IN 1965 CONDUCTED JOINTLY BY TWO JAPANESE FIRMS:

Two Japanese fishing firms will conduct joint whaling operations in the North Pacific

Ocean in 1965. One of those firms will operate the mothership Nisshin Maru No. 3 (23,406 gross tons) which has been assigned a catch target of 1,640 sperm whales. Accompanying that firm's mothership are 1 scout vessel and 6 catcher boats. The other firm will operate the mothership Kyokuyo Maru (11,448 gross tons) accompanied by 2 freezer factoryships (Kyokurei Maru of 9,943 gross tons and the Koyo Maru of 7,658 gross tons), 7 catcher boats, and 3 carrier vessels. Her production target is 534 blue-whale units (30 blue whales,

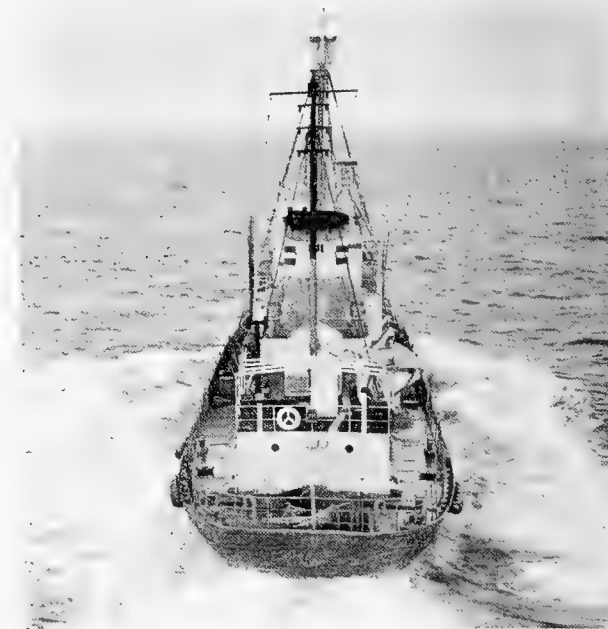


Fig. 1 - Japanese whale catcher vessel in North Pacific.



Fig. 2 - Flensing sperm whale aboard a Japanese factory-mothership in the North Pacific.

## Japan (Contd.):



Fig. 3 - Strip of whale blubber and skin being hauled to foredeck for chopping.



Fig. 4 - Cubing whale blubber strips in foredeck area of factory-mothership.



Fig. 5 - Sperm whale meat ready for freezing.



Fig. 6 - Washing down the deck of Japanese whaling factory-mothership in North Pacific.

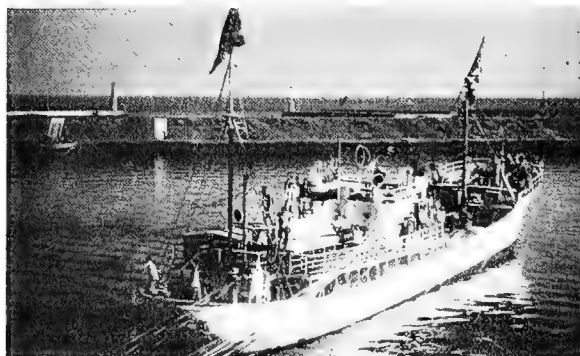
680 fin whales, and 1,200 sei whales). Both mothership fleets were scheduled to depart Japan on May 20, 1965. (Suisan Keizai Shim-bun, April 18, 1965.)

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#### YAIZU FISHERY LANDINGS, APRIL 1965:

A total of 18,720 metric tons of fish valued at 1.9 billion yen (US\$5.3 million) was landed

Yaizu Fish Landings and Ex-Vessel Value, April 1965					
	Quantity		Ex-Vessel Value		Ex-Vessel Price Per Ton
	1965	1964	1965	1964	1965 1964
	. (Metric Tons) .		. (US\$1,000) .		. . (US\$) . .
<b>Tuna:</b>					
Bluefin . . .	7,011	7,384	2,734	2,567	390 348
Albacore . .	4,684	1,959	1,469	654	314 334
Skipjack . .	2,646	2,558	724	609	274 238
Mackerel . .	3,711	4,733	377	372	102 79
Other . . . .	668	834	178	178	267 213
<b>Total . .</b>	<b>18,720</b>	<b>17,468</b>	<b>5,482</b>	<b>4,380</b>	



Japanese tuna long-liner leaving Yaizu, principal tuna port, for the Indian Ocean fishing grounds.

## Japan (Contd.):

at Yaizu during April 1965, according to data compiled by the Yaizu Fishermen's Cooperative Association. This marks a new April high in quantity and value for that port. (Suisan Keizai Shimbun & Suisancho Nippo, May 11, 1965.)

\* \* \* \* \*

## EXPORT TARGETS FOR FISHERY AND AQUATIC PRODUCTS, FISCAL YEAR 1965:

Japan's export target for fishery and aquatic products in fiscal year 1965 is valued at US\$299.9 million, an increase of 3.0 percent above the value of similar products exported in 1964. Canned fishery products account for 42.0 percent of the total value, frozen and fresh products 36.0 percent, cultured pearls 19.0 percent, salted and dried products 2.0 percent, and agar-agar 1.0 percent.

The proposed exports of canned fishery products in 1965 of 12.2 million cases valued at \$127.1 million is an increase of 5.9 percent in quantity and a 0.6 percent decrease in value

as compared with exports during the previous year.

Japan's proposed exports of frozen fishery products in 1965 total 279,050 metric tons valued at \$92.4 million, an increase of 7.4 percent in quantity and 8.5 percent in value above the exports in 1964. The proposed exports of frozen fishery products in 1965 show sharp increases for tuna, salmon, and shrimp. (Fisheries Attache, United States Embassy, Tokyo, April 30, 1965.)

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## 1965 IMPORTS OF SALMON ROE FROM U. S. AND CANADA:

A number of Japan's large fishing firms have made arrangements to import into Japan in 1965 a total of about 1,500 metric tons of salmon roe from the United States and Canada. (Minato Shimbun, May 9, 1965.)

\* \* \* \* \*

## FISHING VESSEL ACTIVITIES:

The Japanese 3,500-ton stern trawler Akebono Maru No. 72 departed Kurihama, Kana-

Japanese Export Targets for Fishery and Aquatic Products, Fiscal Year 1965

Product	FY 1965		FY 1964			
	Export Target		Export Target		Actual Exports	
	Qty.	Value <sup>1/</sup>	Qty.	Value <sup>1/</sup>	Qty.	Value <sup>1/</sup>
	1,000 Cases	US\$1,000	1,000 Cases	US\$1,000	1,000 Cases	US\$1,000
<b>Canned Fish:</b>						
Tuna . . . . .	5,000	38,863	4,450	37,513	4,565	37,002
Salmon . . . . .	1,230	41,624	1,395	43,962	1,365	45,703
Crab meat . . . . .	511	12,658	438	11,004	554	13,118
Sardines . . . . .	110	782	100	780	44	356
Saury . . . . .	1,200	7,464	1,650	10,680	1,090	6,684
Horse-mackerel . . . . .	1,010	6,310	600	3,948	882	5,825
Other fish and shellfish . . . . .	3,136	19,415	2,590	17,521	3,014	19,192
Total canned fish . . . . .	12,197	127,116	11,223	125,408	11,514	127,880
	Metric Tons		Metric Tons		Metric Tons	
<b>Frozen Fish &amp; Shellfish:</b>						
Tuna . . . . .	178,000	64,507	177,804	61,627	156,198	56,607
Swordfish . . . . .	6,350	4,568	6,800	4,320	6,018	4,329
Salmon . . . . .	1,500	1,580	1,500	1,940	1,164	1,228
Rainbow trout . . . . .	1,700	1,500	1,500	1,415	1,690	1,482
Shrimp . . . . .	1,500	2,250	1,500	2,174	1,235	1,850
Other . . . . .	90,000	18,000	55,000	13,530	93,461	19,641
Total frozen fish & shellfish . . . . .	279,050	92,405	244,104	85,006	259,766	85,137
Fresh fishery products . . . . .	48,000	14,740	55,500	16,095	16,900	5,191
<b>Other Products:</b>						
Salted and dried . . . . .	4,444	6,100	4,200	5,800	4,397	6,029
Agar-agar . . . . .	600	2,050	350	1,260	600	2,046
	Kans <sup>2/</sup>		Kans <sup>2/</sup>		Kans <sup>2/</sup>	
Pearls (cultured) . . . . .	20,500	57,500	19,000	51,300	20,054	55,148
Total value of all products		299,911		284,869		281,431

<sup>1/</sup>Based on f.o.b. prices in Japan.

<sup>2/</sup>In kans: One kan equals 8,267 pounds.

Note: Fiscal Year begins April 1.

Source: Export Approval Statistics and Customs Clearance.



## Japan (Contd.):

gawa Prefecture, April 28, 1965, for the eastern Bering Sea. (Suisan Keizai Shimbun, April 29, 1965.)

The fish-meal freezer-factoryship Soyo Maru (11,192 gross tons) was scheduled to depart for the eastern Bering Sea on May 15 from central Japan. Her production target is 5,000 metric tons of fish meal and 6,000 tons of frozen herring. (Suisancho Nippo, May 7, 1965.)

The 3,470-ton stern trawler Takachiho Maru, presently operating in the Gulf of Alaska, was scheduled to return to Tokyo on May 21. (Suisan Tsushin, May 12, 1965.)

The 5,043-ton tuna factoryship Yuyo Maru departed Tokyo, May 11, for the South Pacific tuna fishing grounds off the Fiji Islands. The factoryship, which has a catch target of 8,000 metric tons of tuna, is scheduled to remain on the fishing grounds for about 116 days. A total of 55 catcher vessels is expected to fish for the factoryship.

The 2,500-ton stern trawler Teshio Maru (completed in late April 1965) was scheduled to depart Tobata, Fukuoka Prefecture, for the west African trawling grounds on May 12. (Suisan Keizai Shimbun, May 12, 1965.)

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## VESSEL CONSTRUCTION, APRIL-MAY 1965:

Construction of the Japanese stern trawler Shinsei Maru (1,902 gross tons) was completed in April 1965 and was scheduled to leave for the West African trawling grounds about May 20. The vessel was built for the Yamaguchi Prefectural Fisheries Producers Association. The vessel's specifications are: length 75 meters (246 feet); beam 13 meters (43 feet); fish-hold capacity 2,304 cubic meters (81,330 cubic feet); freezing room capacity 304 cubic meters (1,073 cubic feet); daily freezing capacity 40 metric tons; cruising speed 12.3 knots; and complement 68 men. (Minato Shimbun, May 14, 1965.)

The vessel Taikei Maru (212 gross tons), reported to be the first Japanese purse seiner equipped with two power blocks, was completed at Ishinomaki, Miyagi Prefecture, on May 6. On May 10, the vessel was sent to the skipjack tuna fishing grounds south of Hachijojima. The island is located some 120 miles

south of Tokyo. (Suisan Keizai Shimbun, May 14, 1965.)

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## VIEWS ON EXTENSION OF NORTHWEST PACIFIC FISHERIES TREATY WITH THE SOVIET UNION:

The Japanese-Soviet Fisheries Treaty, under which salmon and king crab fishing are regulated in the Northwest Pacific, will expire December 12, 1966. Japanese views on extension of the Treaty were summarized in the Japanese periodical Nihon Keizai, May 9, 1965, as follows:

There is a strong possibility that the Japanese-Soviet Fisheries Treaty will be extended without amendment. The usefulness of the Treaty was emphasized in a Joint Communique issued by the Soviet Fisheries Minister and the Japanese Minister of Agriculture and Forestry. Their statement was issued during the Japanese Minister's visit to the Soviet Union in the spring of 1965.

There is some Japanese dissatisfaction with the Treaty. However, Japanese requests for changes in the Treaty might be met by Soviet demands to: (1) equalize the salmon catch quotas (Japan's quota in 1965 was set at 115,000 metric tons, as against 85,000 tons for the Soviets) and (2) exclude king crab fisheries on the west coast of Kamchatka Peninsula from the Treaty on account of the coming into force of the International Convention on the Continental Shelf.

Under the circumstances, the Japanese have adopted a waiting attitude, at least for the time being. In this regard, the reported policy of the Japanese Agriculture-Forestry Minister during his Soviet visit was to discuss revision of the Treaty only if the matter was raised by the Soviets. Apparently the talks between the Japanese and Soviet Ministers did not extend to revisions of the Treaty as their Joint Communique mentioned only the usefulness of the Treaty. (United States Embassy, Tokyo, May 12, 1965.)

Note: See Commercial Fisheries Review, June 1965 p. 42, April 1965 p. 72.

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## ROLE OF FISHERIES AND AGRICULTURE IN NATIONAL ECONOMY:

Japan, which ranks second to Peru in fish production, is commonly acknowledged as a fish-producing nation, and Japan's national income from fishing in fiscal year 1963 was

## Japan (Contd.):

¥387.5 billion (US\$1.1 billion). But that income from fishing accounted for only 2.1 percent of the Japanese gross national income in FY 1963, and the number of Japanese (626,000) engaged in fishing constituted only 1.3 percent of the total number employed. However, the income from fishing was substantially higher in fiscal year 1963 (starts in April) than in fiscal year 1962 when it was ¥355.7 billion (almost \$1.0 billion).

Agricultural income in relation to gross national income in 1963 was only 9.2 percent, while the number of workers engaged in farming was 25.9 percent of the total employed.

Further, the importance of fishing and agriculture in the national economy is diminishing due to the rapid tempo of the nation's industrial development.

Japan leads the world today in production of ships, cameras, and motion pictures. Her electronic industry ranks second in the world after that of the United States, while her iron, steel, chemical, and watch industries rank third in the world.

Some 53 percent of Japan's total volume of exports is composed of products of the heavy and chemical industries. Exports of fishery products in 1963 totaled \$280 million and were estimated to comprise between 5 to 6 percent of total exports. (Japan Report, April 30, 1965; Japan 1964 "White Paper" on Fisheries.)

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#### HEARING ON IMPORTS OF SOVIET POLLOCK FOR FISH MEAL:

The Standing Committee for Audit of Japan's House of Representatives held a hearing on May 12, 1965, to discuss the proposed plans of major Japanese firms to enter into joint agreements with the Soviet Union to import 120,000 metric tons of Soviet-produced Okhotsk Sea Alaska pollock for manufacturing into fish meal and the effect such plans, if approved, may have on the domestic fishery.

Japan's Fisheries Agency Production Division Chief stated that as of that time formal applications to engage in such an enterprise had not been received by the Agency. He expressed belief that the pollock resources off the Hokkaido coast and those off the west Kamchatka coast were distinct, and that the

resources off west Kamchatka would not likely be in danger unless large-scale operations were conducted.

The Ministry of Agriculture and Forestry's Parliamentary Vice-Minister stated he hoped to see the use of Soviet-caught Alaska pollock limited to 35,000 metric tons.

In January-March 1965, one large Japanese firm operated the 14,000-ton factoryship Hoyo Maru in the Okhotsk Sea and processed into fish meal 36,300 tons of Soviet-caught Alaska pollock. That firm was reported to have signed a three-year contract with the Soviet Union. At least two other firms were said to be interested in participating in similar ventures with the Soviet Union. (Suisan Keizai Shimbun, May 12, 1965 and other sources.)

Note: See Commercial Fisheries Review, May 1965 p. 76; Mar. 1965 p. 83.

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#### PRIVATE KELP AGREEMENT WITH SOVIETS EXTENDED TWO YEARS:

A Japanese-U.S.S.R. agreement to extend the private kelp fishery agreement (originally concluded in 1963) between those two countries for a period of 2 years was concluded at Moscow on April 12, 1965.

Under the agreement, Japanese fishermen will be permitted to harvest kelp in a selected area in the Nemuro Straits by paying a stipulated fee to the Soviet Union. One change in the original agreement has been made on the harvesting of finfish by Japanese kelp fishermen. Previously, they were not permitted to harvest anything but kelp but will under the new agreement be permitted to catch up to 10 kilograms (22 pounds) of fish per person per day for personal use. (Shin Suisan Shimbun Sokuho, May 15, 1965 and other sources.)

Note: See Commercial Fisheries Review, October 1964 p. 72.

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#### UNDERWATER FISH FARM PROGRAM PLANNED:

The Japanese Fisheries Agency has been actively pushing forward plans to develop bottom marine resources through "underwater fish farming." The plan is said to have the firm support of Japan's State Minister who initially suggested it as a means of developing the bottomfish resources of the Continental Shelf. The Minister was reported to have agreed to the inclusion of a supplementary allotment in the current fiscal year's (April 1,

## Japan (Contd.):

1965-March 31, 1966) budget to initiate the program.

The Agency plans to collaborate with other Japanese government agencies in the development and improvement of submersible equipment, establish a site for training fishermen in diving techniques, and map areas on the Continental Shelf suitable for underwater fish farming. (*Suisan Keizai Shimbun*, May 15; *Shin Suisan Shimbun Sokuho*, May 18, 1965.)



## Mexico

FISHING CENTER AT TAMPICO:

Although Tampico (on the Gulf of Mexico) is far from being Mexico's largest fishing port, it is an important supplier of fresh fishery products to northeastern Mexico, and it contributes significantly to the export market.

Tampico originally was noted for its blue crabs, which are called "jaibas." Although production has fallen off, Tampico still provides about a third of the Mexican blue crab production, and no visitor would think of leaving the city without a taste of this delicacy.

Tampico is also the leading producer of red snapper--the most popular high-priced fish in all Mexico. Annual landings of red snapper in Tampico during 1958-1961 averaged 1,222,000 pounds. Some of the red snapper catch is exported to the United States.

The red snapper fleet at Tampico consists of about 80 vessels. Some are diesel-powered 40-footers that remain on the fishing grounds as long as a week; others are open canoes, powered with outboard motors, that make 1-day trips. All red snapper fishing is done with lines. The larger vessels use large hand-powered steel reels to haul their monofilament lines.

Tampico's two shrimp-freezing plants accounted for 1.4 percent of Mexico's shrimp production in 1963. During 1957-1963, annual average landings of shrimp at Tampico were 2 million pounds live weight. Most of the production is exported to the United States as frozen headless shrimp in 5-pound cartons. The small rock shrimp, which are taken incidentally with the predominant catch of large



Fig. 1 - Shrimp trawlers moored alongside dock of Tampico freezer plant.

brown shrimp, are cooked, headed, and peeled, and then shipped to the Mexico City market for the shrimp cocktail trade.



Fig. 2 - Some of the 50-vessel Tampico shrimp trawling fleet while in port.

The shrimp fleet at Tampico consists of about 50 trawlers. A few are Texas vessels that came to Tampico years ago before Mexican legislation banned imported shrimp vessels. Five are steel craft built in Tampico. The remainder are wooden vessels, built mostly in Tuxpan, Veracruz. The shrimp vessels fish close to home and seldom stay at sea as long as 10 or 12 days. The usual trip is no more than 6 days--much less than at most Mexican ports. Tampico shrimp have a reputation for being in very good condition when landed.

As most trawling is done at night, the shrimp fishermen take advantage of daylight hours to hand line for red snapper. The availability of these high-priced fish and the willingness of the Tampico shrimp plants to han-

## Mexico (Contd.):

dle finfish, contrary to usual practice at many ports, provide all concerned with additional income. The shrimp trawlers at Tampico are individually owned and are manned by members of fishermen's cooperatives.

Tampico considers itself the "oyster capital" of Mexico since it is the closest large city to Laguna Tamiahua, Mexico's largest oyster-producing area. The Mexican total oyster harvest averaged 42 million pounds live weight annually in 1961-63. By volume, oysters rank second only to shrimp as Mexico's most important fishery product. Whereas most of the shrimp is exported, practically all of the oyster harvest is consumed within Mexico. Oyster bars are featured in every seacoast town and in all the larger inland cities--and 87 percent of their supply comes from Laguna Tamiahua, much of it funneled through Tampico. Practically all of the oysters are shipped live to market. Familiar sights at seafood restaurants and "ostionerías" are crews of oyster shuckers with their piles of freshly opened shells.



Fig. 3 - Oyster-processing and freezing plant at Tampico. Oysters processed there come from Laguna Tamiahua and are shipped to Brownsville, Tex.

Mexico's only oyster freezing and exporting plant is located in Tampico. The plant packs frozen shucked oysters in plastic containers of 3-pound capacity. The frozen oysters are shipped by truck to Brownsville, Tex.

The Mexican Bureau of Fisheries is constructing a new marine biological station at Tampico because of its importance as a fishery center. The new station, which will replace a temporary laboratory, was scheduled for completion in May or June 1965. (Regional

Fisheries Attache, United States Embassy, Mexico, D.F., April 26, 1965.)

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# FISHING INDUSTRY OF OAXACA MAKES EXCELLENT PROGRESS:

The Government-controlled Decentralized Fishing Enterprise of the State of Oaxaca in southern Mexico was established and dedicated on May 29, 1964. The purpose of the enterprise is to develop that State's fisheries and relieve the serious shortage of animal protein in the diet of the people of Oaxaca. With a coastline of 500 kilometers (311 miles) and three fishing ports, State officials believed Oaxaca could be self-sufficient in providing fishery products to its people. Since its establishment, the State enterprise has made rapid progress and has made available to the people more fish and fish products as part of their diet.

From the viewpoint of seafood in the diet, the capital city of Oaxaca is typical of dozens of small cities in Latin America. The people, unable to obtain seafood in quantity were not accustomed to eating it, and probably were not aware of their own protein deficiency. The factors leading to such a situation are not uncommon. They include the distance from the seacoast and large lakes, and also because the population of 75,000 is too small to provide a profitable market for private enterprise. The one developed fishing port of Salina Cruz in the State of Oaxaca, although only 170 miles away by good highway, is a shrimp fishing port which produces high-priced shrimp for export, and its food-fish production can all be absorbed by the cluster of nearby cities. The other fishing ports are tiny undeveloped villages which until recently lacked even poor road connections with the city of Oaxaca. As a result, like in so many other places, the only fishery products available were dried shrimp, imported dried fish, and some local dried fish of variable quality.

The State Governor decided to change that situation and started with a modest program which could be financed locally and could be expanded as the need grew. He chose as general director of the program a leading citizen who was already operating successful businesses and civic activities. The aim of the program was to supplement the dietary needs of the people with the lowest income by providing high protein food at the lowest cost.

Mexico (Contd.):



Fig. 1 - Note state of Oaxaca, south of Guerrero.

The Oaxaca State Legislature appropriated one million pesos (US\$80,000), a nominal sum, but enough to do the job. A site for a cold-storage plant and the retail shop was rented and the building was completely rebuilt and equipment installed. Three trucks were purchased--a 5-ton highway truck for hauling fresh fish from the coast, a delivery van for hotels, hospitals, and other institutions, and a general service pick-up truck. Meanwhile, the program's general director and others visited fishery production and distribution plants throughout the country to obtain ideas. Some dozen young men were recruited and sent to one of the big markets in Mexico City for training in fish handling. They were also trained in truck operation, how to clean and freeze fish, wait on customers, and how to operate the freezer and cold-storage plant.

The State also received advice and help from Mexico's National Consultative Fisher-

ies Commission and the Bureau of Fisheries, the regional fisheries officer of the Food and Agriculture Organization (FAO), the National Bank for the Development of Cooperatives, and the Secretariats of Health and Marine.

The retail store in Oaxaca, with its freezer and cold-storage plant, is the heart of the project. There people from the city and its surrounding market area can buy a good variety of fresh and frozen fish and shellfish at fixed low prices. The response to the project has been excellent and has been helped by an advertising campaign which is geared to the national "eat-more-fish" program. During the first three months of the program, sales totaled \$12,000 and since then have increased considerably.

The people, being accustomed to imported dried fish, have also responded well to new dried fishery products which now constitute a

## Mexico (Contd.):

large share of total sales. Experimental packs of canned fish, usually in combination with rice or vegetables and with the traditional seasoning of Oaxaca, show great promise. The dried and canned products will prove particularly useful as the program expands into the smaller towns where refrigeration facilities are lacking.

A secondary objective of the program is to improve the living conditions of the people in the fishing villages, while at the same time insuring a steady supply of fish. The two principal villages of Puerto Angel and Puerto Escondido, each with its surrounding fish camps on coast and lagoon, are about 165 miles from the city of Oaxaca, on separate more or less parallel roads. Under another State program both roads have been improved and the trip over very mountainous terrain can be made in 5 or 6 hours. Until the outset of the program, the facilities of both those villages were primitive. Fishing was done only from canoes, and mostly still is. The fishermen had no assurance of a market and therefore had no incentive. At the beginning, the plant in Oaxaca could seldom obtain enough fish from the two villages and had to send its truck to the Gulf Coast of Veracruz to buy fish it needed.

Plans to improve conditions at both those villages include construction or improvement of small wharves and some channel dredging. The fishermen's cooperative at Puerto Angel



Fig. 2 - A fish-cookery demonstration in a Mexican marketplace. Samples of the dish prepared are distributed together with recipes.

has been reorganized, and a new cooperative at Puerto Escondido has been formed. Loans are being arranged with the National Bank for the Development of Cooperatives for larger fishing vessels and for motorizing existing craft. Also, a practical fishing school is planned. A pilot fish-salting plant at Puerto Escondido may later lead to the establishment of others. A local young man has been sent on a scholarship to study at the Institute of Marine Sciences in Veracruz, and on his return will be stationed on the coast to advise the fishermen.

The result so far has been an increase in the total daily consumption of fishery products in the city of Oaxaca from 100 to 500 kilograms (220 to 1,102 pounds), during the first three months, which was believed would continue to increase.

The results of the program were felt to far outweigh the cost which was given as: (1) State appropriation \$80,000 with total spent through August 31, 1964, \$92,000; (2) investment in plant, including conversion and equipment, most of which had to be imported, \$45,000; (3) purchase of three trucks, \$15,000; (4) operations through August 31, 1964, including salaries, rent, utilities, purchase of fish, supplies, advertising, and studies at other plants, \$32,000; and (5) sale of fish, \$12,000. (Regional Fisheries Attache, U. S. Embassy, Mexico, March 30, 1965.)

Note: See Commercial Fisheries Review, April 1964 p. 63.



## Morocco

## EXTENDED TUNA FISHING VENTURE SHOWS PROMISING RESULTS:

A small fleet of Moroccan tuna vessels in early 1965 sailed as far south as the Ivory Coast, over 2,000 miles from their home port of Agadir. The venture may be a breakthrough in extending the short range of Morocco's fishing fleet. Following is a summary of the expedition as given by one of its promoters and published in La Vie Economique, April 9, 1965:

Seven Moroccan vessels sailing out of Agadir have carried out a tuna fishing expedition of several months duration from Senegal to the Ivory Coast. The project was a cooperative venture between private vessel owners and an Agadir cannery. Although relatively modest in terms of modern commercial



## Morocco (Contd.):

fishing, it was a serious experimental effort to improve Morocco's fishing and canning industry. Canned fish is the third most important Moroccan export, but the industry is handicapped by its dependence upon an uncertain supply of fish.



The small Moroccan tuna expedition began to fish for red (bluefin) tuna off Senegal in January 1965 and took a good catch of tuna, mackerel, and anchovy. When the tuna disappeared from Senegalese waters in mid-January, operations were shifted to warmer waters off the Ivory Coast. A British freezer-ship was engaged to accompany the small fleet. By the end of March 1965, a total of 360 metric tons of fish (mostly tuna, mackerel, and anchovy) had been caught.

The Moroccans are well aware that their vessels must be improved and better equipped for deep-sea tuna fishing. Also needed is a mothership equipped with freezing facilities and radio and radar. Such a mothership accompanying the tuna vessels could provide information on the movements of tuna schools, and process and store the catch.

The Moroccan vessels that took part in the extended expedition were inferior to the modern vessels of the other countries operating in the area. In addition, the Moroccan crews could not match the skill of their foreign counterparts. However, that was due primarily to the lack of proper equipment and experience. The Moroccans had no practical ex-

perience in offshore tuna fishing along the coast of West Africa. They had to learn their trade on the job. During the expedition, the Moroccans reportedly adapted themselves to their tasks and handled their nets well. They also demonstrated that a Moroccan crew can spend extended periods of time at sea.

The expedition was described as a useful step in Morocco's efforts to develop a modern fishing industry. (United States Embassy, Rabat, April 21, 1965.)

\* \* \* \* \*

#### NEW PLANT TO PRODUCE FISH PROTEIN CONCENTRATE:

Full-scale production of fish protein concentrate (FPC) was scheduled to begin in late May 1965 at the recently completed Moroccan plant at Agadir. The plant is expected to use 50 metric tons of sardines a day for a daily output of 6.5 to 7 tons of FPC. Total production during the 220-day fishing season could reach 1,500 tons, according to an official of the Moroccan Government. The project is a joint enterprise of private capital and the Moroccan Government.

Machinery at the new plant underwent trials during a break-in period in early May 1965. Results were said to be encouraging. (United States Embassy, Rabat, May 4, 1965.)

Note: See Commercial Fisheries Review, June 1965 p. 65.



#### Nicaragua

##### FISHING LIMITS OF 200 MILES CLAIMED:

Nicaraguan Presidential Decree No. 1-L, establishing a national fishing zone "between the coast and a line parallel to the same situated 200 nautical miles at sea" on both the Atlantic and Pacific Coasts, became effective on publication in La Gaceta, No. 82, April 8, 1965. The new decree declares that any act of fishing carried out within the "national fishing zone" is subject to Nicaragua's "General Law on the Exploitation of Natural Resources," and its complimentary laws (i.e., the "Special Law on the Exploitation of Fish," of March 3, 1961) and those which may be decreed in the future.



## Norway

### CANNED FISH EXPORTS, YEAR 1964 AND JANUARY 1965:

Preliminary data show that Norway's total exports of canned fishery products in 1964 were up about 5 percent from the previous year due mainly to larger shipments of canned brisling.

Norwegian Exports of Principal Canned Fishery Products		
	1964	1963
	(Metric Tons)	
Brisling . . . . .	7,046	5,368
Smoked small sild . . . .	14,384	14,927
Kipperd herring . . . . .	3,264	3,149
Soft herring roe . . . . .	1,141	719
Shellfish . . . . .	1,623	1,547
Other fishery products . . .	3,565	3,881
Total . . . . .	31,023	29,591

During January 1-23, 1965, Norwegian canned fish exports totaled 2,067 tons (414 tons brisling, 1,230 tons small sild, and 423 tons other fishery products), according to a preliminary report. In the same period of January 1964, exports were 1,926 tons (417 tons brisling, 949 tons small sild, and 560 tons other fishery products).

The Norwegian 1965 fishing season for "big sild" started in February and 14,897 standard cases had been canned as of February 13, 1965, compared with 24,192 standard cases in the same period of 1964. (Norwegian Cannery Export Journal, March 1965.)

\* \* \* \* \*

### LOFOTEN COD FISHERY DOWN IN 1965:

Norway's 1965 Lofoten cod fishery during the spawning season yielded a catch of only 19,500 metric tons valued at US\$4.2 million, a decrease of 4,100 tons from 1964 and down 9,000 from 1963. The average ex-vessel price (liver and roe included) was 1.55 kroner a kilogram or 9.8 U. S. cents a pound.

The main reason given for the declining catches of spawning cod in Norwegian waters is said to be overexploitation of the Arctic cod stocks in the Barents Sea. (United States Embassy, Oslo, April 24, 1965.)

Note: See Commercial Fisheries Review, May 1965 p. 81.

\* \* \* \* \*

### WINTER HERRING FISHERY, 1965:

The 1965 Norwegian fishery for winter herring ended on March 27 with a catch of 2,443,000

hectoliters (227,199 metric tons) as compared with 3,078,000 hectoliters (286,254 tons) in 1964. The catch did not fulfill the high hopes set at the end of the opening week of the winter herring fishery in mid-February when 150,000 tons were landed.

The lower 1965 catch was due to unfavorable weather conditions and also because the herring failed to show up at traditional spawning grounds in the Vestfjord. More than 90 percent of the catch was taken by purse seiners. About 52,359 tons of herring were sold for human consumption as fresh fish, and for freezing, canning, and salting. Reduction plants received less fish from the winter herring fishery than the previous year--about 77 percent of the catch as compared with 81 percent in 1964. (United States Embassy, Oslo, April 12, 1965.)

Note: See Commercial Fisheries Review, May 1965 p. 83.



## Pakistan

### FISHERIES INVESTMENT OPPORTUNITY:

Ganisons Industries Ltd., a Karachi importing firm which entered the fish processing and freezing field in 1964, is seeking the participation of a United States investor prepared to invest about Rs 1 million (US\$208,000) to expand the firm's shark-liver oil plant. Dr. Mohamed Hussein, Managing Director of Ganisons Industries, planned to visit the United States in early May 1965 to meet interested investors.

Sharks abound in Pakistan waters, yet there are no facilities at present in the country for processing shark meat, skin, and fins. This would appear to offer an opportunity for a sizable shark-processing industry in Pakistan, and Dr. Hussein believes there is a market for shark-liver oil, frozen shark meat, and shark-fin soup in Europe and the United States.

An added incentive to foreign investors in the Karachi firm would be the possibility of exporting fishery products under Pakistan's Export Bonus Scheme. Under that scheme, an exporter is entitled to receive import licenses amounting to about 30 percent of the foreign exchange earned through exports. Exemption from certain Pakistan taxes might also be available to investors in the shark-processing industry.

## Pakistan (Contd.):

Ganisons Industries enjoys a good business reputation in Pakistan business and government circles. (United States Embassy, Karachi, April 21, 1965.)



## Peru

FISH MEAL INDUSTRY TRENDS,  
EARLY SPRING 1965:

Peruvian anchoveta landings, fish meal output, and fish meal prices were all at high levels at the start of the second quarter.

Peruvian price quotations in early May 1965 for July-December delivery of fish meal were running as high as US\$147 f.o.b. Peruvian ports.

Peruvian fish meal output in the first quarter of 1965 totaled 508,000 metric tons, up about 2 percent from the same period of 1964. Exports during January-March 1965 of 465,000 tons were up almost 20 percent from the 389,000 tons shipped in the first quarter of 1964. A good inventory position at the start of 1965 contributed to the increase in exports.

But the Peruvian Government remains concerned about the long-term prospects for the industry and has issued a decree declaring that no additional licenses will be issued for the expansion or construction of new fish-meal plants.

Scientists at the Peruvian Marine Institute report warm water continues to move into the normally cold anchoveta fishing grounds. The question still hanging over the industry is what effect the warm water and the heavy catch of "peladilla" (young fish) will have on the availability of anchoveta when the season picks up again in October, after the normal third quarter slump. Data through the first half of April 1965 point to a catch during the first half of the year approaching, if not exceeding, that of last year. (United States Embassy, Lima, May 9, 1965.)

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MARINE OIL SUPPLY  
AND DISPOSITION, 1961-1964:

Fish Oil: Peruvian production of fish oil in 1964 showed only a small increase over

1963. Output in 1964 was held down by the relatively low oil yield of the record anchoveta catch.

Peruvian fish oil production makes up most of the available supply since carry-over stocks are usually small and imports are insignificant (table 1).

Table 1 - Peruvian Supply and Disposition of Fish Oil<sup>1/</sup>, 1961-1964

	2/ 1964	1963	1962	1961
	..... (Metric Tons) .....			
Supply:				
Opening stocks, Jan. 1	5,917	4,905	2,308	5,439
Production .....	160,000	154,871	150,784	118,886
Total supply <sup>3/</sup> . . .	165,917	159,776	153,092	124,325
Disposition:				
Exports .....	110,559	125,477	127,969	102,306
Apparent domestic disappearance:				
Edible consumption .	9,000	7,000	5,000	4,500
Industrial use . . . .	26,358	21,382	15,218	15,211
Closing stocks, Dec. 31	20,000	5,917	4,905	2,308

<sup>1/</sup>Does not include data on whale oil and sperm oil.

<sup>2/</sup>Estimated.

<sup>3/</sup>Imports are not included since they are relatively insignificant and complete data are not available. The Peruvian Ministry of Finance and Commerce and Customs reported Peruvian imports of inedible fish oil in 1964 as 541 tons of hydrogenated fish oil and 53 tons of cod-liver oil.

Domestic consumption of fish oil is rising in Peru, but exports are still the dominant factor in the industry. Peruvian exports of fish oil in 1964 totaled 110,559 metric tons



## Peru (Contd.):

with a value of S377 million (US\$14.1 million), as compared with exports in 1963 of 125,477 tons valued at S217 million (\$8.1 million). For 1964, that was a decline of 12 percent in quantity, but a gain of 74 percent in value. Rising prices for fish oil prevailed on the world market in 1964.

Data on Peruvian fish oil exports by country of destination are not yet available for 1964, but in 1963 the leading buyer was the Netherlands followed by the United Kingdom, West Germany, and Denmark (table 2).

Table 2 - Peruvian Exports of Marine Oil by Country of Destination, 1963

Commodity and Country of Destination	Quantity	Value	
		Metric Tons	US\$ 1,000
<b>Fish Oil:</b>			
United States . . . .	629	1,812	67.6
Belgium . . . . .	337	542	20.2
Colombia . . . . .	7,213	21,659	807.6
Denmark . . . . .	11,215	15,207	567.0
Ecuador . . . . .	81	295	11.0
France . . . . .	2,265	6,216	231.8
West Germany . . . .	20,660	33,755	1,258.6
United Kingdom . . .	20,712	33,844	1,261.9
Netherlands . . . . .	54,851	93,675	3,492.7
Italy . . . . .	68	295	11.0
Japan . . . . .	250	844	31.5
Norway . . . . .	5,082	6,424	239.5
Sweden . . . . .	2,051	2,749	102.5
Total fish oil . .	125,477	217,317	8,102.9
<b>Sperm Oil:</b>			
United States . . . .	8,579	32,640	1,217.0
Netherlands . . . .	500	1,984	74.0
Total sperm oil . .	9,079	34,624	1,291.0
<b>Whale Oil:</b>			
Netherlands . . . .	400	901	33.6

Source: Peruvian Ministry of Finance and Commerce and Customs.

**Whale and Sperm Oil:** Peruvian exports of sperm oil in 1964 amounted to 4,388 tons valued at \$17.1 million (\$636,084), as compared with 9,079 tons valued at \$34.6 million (\$1.3 million) in 1963. Exports of whale oil in 1964 amounted to only 22 tons valued at \$134,000 (\$4,996), as compared with 400 tons valued at \$901,000 (\$33,600) in 1963. (Agricultural Attache, United States Embassy, Lima, April 15, 1965.)

Notes: (1) Peruvian Soles 26.82 equal US\$1.00.

(2) See Commercial Fisheries Review, Nov. 1964 p. 105, and Aug. 1964 p. 83.

\* \* \* \* \*

## EXPORTS OF PRINCIPAL MARINE PRODUCTS, 1963-1964:

Item	1964			1963		
	Qty.	Value		Qty.	Value	
	Metric Tons	Million Soles	US\$ 1,000	Metric Tons	Million Soles	US\$ 1,000
Fish meal . . . .	1,426,119	3,845.3	143,481	1,159,300	1/	1/
Fish oil . . . . .	110,559	377.3	14,078	125,500	217.0	8,700
Fish (frozen, canned, etc.) . .	28,943	225.3	8,407	1/	1/	1/
Sperm oil . . . .	4,338	17.1	638	9,079	34.6	1,300
Whale meal . . . .	2,291	5.0	186	1/	1/	1/

1/Not available.

Note: F.o.b. values converted at rate of 26.8 soles equal US\$1.00.

Source: Callao Customhouse and other sources.



## Portugal

## CANNED FISH EXPORTS, 1963-64:

Portugal's total exports of canned fish in oil or sauce in 1964 were down slightly from the previous year. Sardine shipments--accounted for 79 percent of the total canned fish exports in 1964--showed a small increase. But there was a decline in exports of tuna, mackerel, and anchovy fillets.

Portuguese Canned Fish Exports, 1963-1964

Product	1964		1963	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
<b>In oil or sauce:</b>				
Sardines . . . . .	55,272	2,909	53,484	2,815
Chinchards . . . . .	3,305	174	2,134	112
Mackerel . . . . .	5,349	214	6,323	253
Tuna & tunalike . . .	2,097	70	3,887	129
Anchovy fillets . . .	3,247	325	4,811	481
Others . . . . .	665	35	437	23
Total . . . . .	69,935	3,727	71,076	3,813

Portugal's principal canned fish buyers in 1964 were Germany with 14,017 metric tons, the United Kingdom 9,113 tons, Italy 8,138 tons, France 6,627 tons, the United States 5,990 tons, and Belgium-Luxembourg 4,476 tons. Germany's purchases of canned fish from Portugal in 1964 increased 10 percent from those in 1963. Purchases by the United Kingdom and France were also up. But purchases by the United States and Italy in 1964 were down 16 and 31 percent, respectively. (Conservas de Peixe, February 1965.)

\* \* \* \* \*

## CANNED FISH PACK, 1963-1964:

Portugal's total pack of canned fish in oil or sauce in 1964 was up 22 percent from 1963 due to an expanded sardine pack. The gain

## Portugal (Contd.):

Portuguese Canned Fish Pack, 1963-1964				
Product	1964		1963	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
<b>In oil or sauce:</b>				
Sardines . . . . .	70,209	3,695	49,644	2,613
Chinchards . . . . .	1,542	81	3,363	177
Mackerel . . . . .	4,211	169	6,736	269
Tuna & tunalike . . . .	5,931	196	5,907	197
Anchovy fillets . . . .	3,002	300	4,170	417
Others . . . . .	737	39	600	32
Total . . . . .	85,632	4,480	70,420	3,705

was partly offset by a smaller pack of chinchards, mackerel, and anchovy fillets. (Conservas de Peixe, February 1965.)



## South Africa Republic

FISH PROTEIN  
CONCENTRATE DEVELOPED:

A fish protein concentrate has been developed by the Fishing Industry Research Institute of the South Africa Republic, according to a report in the South African Parliament. The new product is said to be a stabilized fish flour which retains an attractive fish flavor after months of storage. It can be used to prepare fish cakes or, in small quantities, to enrich cereal products. (South African Digest, April 16, 1965.)



## Spain

FISHERY TRENDS AT VIGO,  
JANUARY-MARCH 1965:

**Landings and Prices:** Fishery landings at the Port of Vigo, Spain, in January-March 1965 totaled 13,552 metric tons valued at 190.8 million pesetas (US\$3.2 million), down 49 percent in quantity and 24 percent in value from landings in the last quarter of 1964. As compared with January-March 1964, the first quarter 1965 landings were 13.5 percent less in quantity and the value dropped 16.9 percent. Catches are seasonally low during the first part of the year because of bad weather, and also because sardines and tuna (yellowfin) are scarce on the fishing grounds.

In addition to the fresh fish landings, the freezer-trawler fleet out of Vigo landed 8,550 tons of frozen fish (over 7,000 tons were small hake) valued at 157 million pesetas (\$2.6 million). This compares with 3,686 tons of frozen fish landed in the first quarter of 1964. In 1964 a total of 22,444 tons of frozen fish was landed with a value of 404 million pesetas (\$6.7 million). This was above the estimate of 20,000 tons made earlier in the year by the Vigo firm handling frozen fish.

A number of fishing vessel operators reported they were having difficulties in getting crews. Fishermen were believed emigrating in growing numbers to better paying jobs aboard foreign vessels.

**Canned Fish Industry:** There was very little fish canning activity during the period. An indication of the rate at which the canning industry worked (well below 10 percent of ca-

Table 1 - Landings and Average Ex-Vessel Prices of Selected Species at Vigo, January-March 1965 with Comparisons

Species	1965			1964					
	January-March			October-December			January-March		
	Quantity		Avg. Price	Quantity		Avg. Price	Quantity		Avg. Price
	Metric Tons	Pesetas/Kilo	US\$/Lbs.	Metric Tons	Pesetas/Kilo	US\$/Lbs.	Metric Tons	Pesetas/Kilo	US\$/Lbs.
Octopus . . . . .	3,834	5.07	3.8	1,126	6.51	4.9	906	7.09	5.4
Horse mackerel . . . .	1,617	4.67	3.5	3,239	5.03	3.8	1,934	4.69	3.5
Small hake . . . . .	1,615	38.02	28.8	1,946	31.12	23.5	4,503	26.47	20.0
Cuttlefish . . . . .	692	11.51	8.7	392	9.37	7.1	484	6.99	5.3

Table 2 - Distribution of Fishery Landings at Vigo, January-March 1965 with Comparisons

Period	Shipped Fresh to Domestic Markets	Canned	Other Distribution (Smoking, Drying, Fish Meal, etc.) and Local Consumption
	(Metric Tons)		
1st Quarter 1965 . . . . .	7,113	1,109	5,330
4th Quarter 1964 . . . . .	11,445	8,439	6,735
1st Quarter 1964 . . . . .	11,139	890	3,643

## Spain (Contd.):

capacity) was the amount of fish purchased, which was only about 8 percent of the total landings for the quarter.

The marketing situation was somewhat improved during the first part of 1965. This was probably due to the increase in the rate of tax rebate on exports from 6 percent to 11 percent of the net value of the merchandise exported. That measure was implemented early in 1965, and was made retroactive to July 1, 1964. (United States Consulate, Vigo, April 19, 1965.)

Note: See *Commercial Fisheries Review*, March 1965 p. 90.



## Sweden

### FISH MEAL AND MARINE OIL INDUSTRY TRENDS, FISCAL YEARS 1963/64 AND 1964/65:

**Fish Meal:** Imports account for the bulk of the Swedish fish meal supply. Shipments were up sharply from Norway, Iceland, and Denmark in 1964, although Peru continued as

Table 1 - Swedish Supply and Disposition of Fish Meal, Fiscal Years<sup>1/</sup> 1963/64 and 1964/65

Item	<sup>2/</sup> 1964/65	1963/64
... (1,000 Metric Tons) ...		
<b>SUPPLY:</b>		
Production . . . . .	7.5	7.1
Imports . . . . .	32.0	30.8
<b>DISPOSITION:</b>		
Exports . . . . .	1.0	0.2
Domestic consumption (animal feed) . . . . .	40.5	37.7

<sup>1/</sup>Period from July 1 to June 30.

<sup>2/</sup>Estimated.

Table 2 - Swedish Imports of Fish Meal, Calendar Years 1963-1964

Commodity Country of Origin	1964	1963
... (Metric Tons) ...		
<b>Herring Meal:</b>		
United States . . . . .	16	-
Norway . . . . .	10,108	3,133
Denmark . . . . .	4,785	2,422
Iceland . . . . .	912	20
Peru . . . . .	99	-
Total herring meal . . . . .	15,921	5,575
<b>Unclassified Fish Meal:</b>		
United States . . . . .	270	195
Denmark . . . . .	290	410
Iceland . . . . .	5,121	1,338
United Kingdom . . . . .	343	688
Chile . . . . .	-	3,542
Peru . . . . .	17,274	18,139
Norway . . . . .	270	-
Canada . . . . .	49	-
Total unclassified fish meal . . . . .	23,617	24,312

the leading supplier. Most of the Swedish fish meal supply is used for animal feed. Demand is increasing because of the expansion of the broiler industry.

**Marine Oils:** Sweden is also dependent on foreign sources for the bulk of her marine oil

Table 3 - Swedish Supply and Disposition of Edible Marine Oils, Fiscal Years<sup>1/</sup> 1963/1964 and 1964/1965

Item	<sup>2/</sup> 1964/63	1963/64
... (1,000 Metric Tons) ...		
<b>SUPPLY:</b>		
Opening Stocks <sup>2/</sup> , July 1:		
Whale oil . . . . .	1.5	2.0
Herring oil . . . . .	1.0	1.0
Other marine oils . . . . .	11.8	16.0
Production (herring oil) . . . . .	4.5	4.0
<b>Imports:</b>		
Whale oil . . . . .	-	5.9
Other marine oils . . . . .	40.0	48.3
Total supply . . . . .	58.8	77.2
<b>DISPOSITION:</b>		
Exports . . . . .	3/	3/
Domestic Disappearance:		
Food uses (all marine oils)	26.0	25.4
Other disappearance (all marine oils) . . . . .	3/	3/
Closing Stocks <sup>2/</sup> , June 30:		
Whale oil . . . . .	0.5	1.5
Herring oil . . . . .	0.5	1.0
Other marine oils . . . . .	17.0	11.8

<sup>1/</sup>Period from July 1 to June 30.

<sup>2/</sup>Estimated.

<sup>3/</sup>Not available.

Note: Production and imports are stated on a crude oil basis. The quantity used for food is stated in terms of refined oil. Stocks include crude and refined oils.

Table 4 - Swedish Imports of Marine Fats and Oils, Calendar Years 1963-1964

Commodity and Country of Origin	1964	1963
... (Metric Tons) ...		
<b>Whale Oil, Raw:</b>		
Norway . . . . .	-	5,878
<b>Herring Oil, Raw:</b>		
Norway . . . . .	2	17
Denmark . . . . .	616	330
Iceland . . . . .	-	7,533
West Germany . . . . .	798	-
Total herring oil . . . . .	1,416	7,880
<b>Medicinal Oils:</b>		
Norway . . . . .	2,059	1,714
Denmark . . . . .	92	265
Iceland . . . . .	283	275
Japan . . . . .	-	45
West Germany . . . . .	72	-
United Kingdom . . . . .	26	-
Total medicinal oils . . . . .	2,532	2,299
Hydrogenated marine fats and oils . . . . .	340	504
<b>Unclassified Marine Oils:</b>		
United States . . . . .	24,768	33,384
Norway . . . . .	189	267
Denmark . . . . .	44	1,213
West Germany . . . . .	4,064	7,733
Peru . . . . .	-	698
Iceland . . . . .	1,659	-
Total unclassified marine oils . . . . .	30,724	43,295



## Sweden (Contd.):

supply. Imports from the United States have become increasingly important in recent years as shipments from other countries have declined sharply. United States shipments also declined in 1964, but still accounted for over 70 percent of total Swedish marine oil imports.

Swedish import taxes on edible marine oil (and vegetable oils) in early 1965 totaled 84 ore a kilo (7.4 U.S. cents a pound), as compared with import taxes a year earlier totaling 115 ore a kilo (10.2 U.S. cents a pound).

In fiscal year 1963/64, the Swedish margarine industry consumed 24,274 metric tons of refined marine oil, which was 95 percent of the total edible marine oils used by the domestic food industry. Most of the remaining 5 percent went into baking aids and lard.

Table 5 - Swedish Exports of Marine Fats and Oils, Calendar Years 1963-1964		
Commodity and Country of Destination	1964	1963
	... (Metric Tons) ...	
<b>Herring Oil, Raw:</b>		
Norway .....	3,461	2,941
Other countries .....	209	90
Total herring oil .....	3,670	3,031
<b>Hydrogenated Marine Fats &amp; Oils:</b>		
United States .....	25	-
Norway .....	1,826	2,012
Denmark .....	5,289	5,462
Finland .....	1,246	678
United Kingdom .....	3,498	2,120
Ireland .....	1,170	2,019
France .....	500	634
Austria .....	756	928
Czechoslovakia .....	-	1,313
Other countries .....	439	1,225
Total hydrogenated marine fats and oils .....	14,749	16,391

Sweden maintains a sizable export trade in hydrogenated marine fats and oils. Leading buyers are Denmark; the United Kingdom, Norway, Finland, and Ireland. Raw herring oil is also exported by Sweden, mainly to Norway. (Agricultural Attache, United States Embassy, Stockholm, April 15, 1965.)

Note: See *Commercial Fisheries Review*, June 1963 p. 90.



## Taiwan

## FISHERIES TRENDS IN 1964:

**Landings in 1964:** Taiwan's fishery landings in 1964 totaled 376,398 metric tons, an

increase of 7.3 percent over 1963. In 1964 there were increases in all of Taiwan's fisheries except the outer coastal fishery which dropped 12.7 percent from the previous year.

Taiwan's Fisheries Production, 1963-64		
Type of Fishery	1964	1963
	... (Metric Tons) ...	
Offshore and deep-sea fisheries ..	126,765	119,880
Inshore coastal fisheries .....	161,151	144,023
Outer coastal fisheries .....	32,191	36,854
Fish culture .....	56,291	49,972
Total .....	376,398	350,729

The total fish production target for 1965 has been set at 388,000 tons under that country's 4-year development plan.



Fig. 1 - Tuna displayed before auction at Taiwan's Kaohsiung fish market.

**Fresh-Water Fish Culture:** Taiwan at one time imported from Hong Kong some 15 million Chinese carp fingerlings a year valued at about US\$100,000 for stocking fresh-water ponds. The species were grass carp (*Ctenopharyngodon idellus*), silver carp (*Hypophthalmichthys molitrix*), and black carp (*Aristichthys melanostomus*).

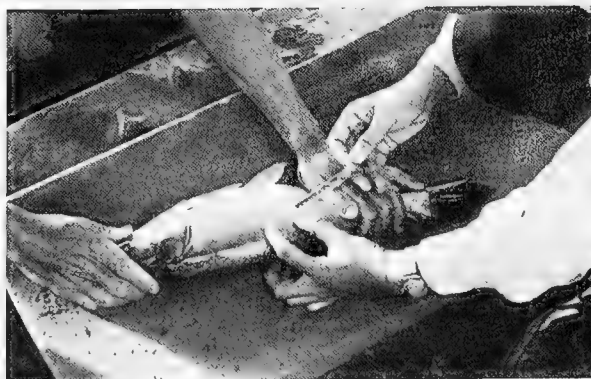


Fig. 2 - Silver carp being injected with pituitary hormone to induce rapid spawning.

## Taiwan (Contd.):

michthys molitrix), and big head carp (Aristichthys nobilis). In 1964, fish culturists in Taiwan succeeded in artificially propagating those fish by hormone-induced spawning and hatching the fertilized eggs in running water. It is estimated that 3 to 5 million fingerlings were produced commercially that year. With the artificial propagation technique further refined, it is expected that sufficient fry will be produced in 1965 to meet all of Taiwan's needs.

**Vessel Construction:** The construction of the thirteen 300-ton tuna long-liners and three 100-ton tuna long-liners financed by a World Bank loan is under way, and most of them are expected to be completed and ready to begin fishing by the end of 1965.



Fig. 3 - Shows launching of a newly built Taiwan tuna long-liner.

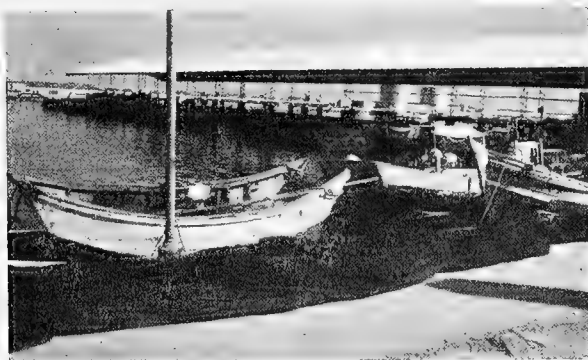


Fig. 4 - Fish market at Makung on Pescadores Island, Taiwan.

A newly formed private fishing firm in Taiwan has obtained a loan of NT\$34 million (US\$850,000), half of which is from the American-Chinese Joint Commission of Rural Reconstruction and half from the Cooperative Bank of Taiwan, to finance the construction of ten 120-ton tuna long-liners. When completed,

they will fish in the Western Indian Ocean using Port Louis (Mauritius), in the Mascarene Islands group, as the base of operation.

Note: See Commercial Fisheries Review, June 1965 p. 78; April 1965 p. 51; April 1964 p. 69.



## Tonga Islands

**LARGE SHRIMP CAUGHT IN SOUTH PACIFIC LAGOON WATERS:**

Large shrimp (heads on) measuring from 4 inches and up were caught for the first time in the lagoon at Tongatapu, the main island of the Tonga Islands group in the South Pacific Ocean. They were caught in a Japanese treble-mesh net in the deeper areas of the lagoon.

The Tonga Government has been interested in the fishing potential of the lagoon and tested the area with that type Japanese net which had been set at various depths. (Pacific Islands Monthly, January 1965.)



## U.S.S.R.

**JAPAN LAUNCHES SECOND IN SERIES OF FACTORYSHIPS FOR SOVIETS:**

A Japanese shipbuilder announced the launching at Yokohama on April 22, 1965, of the fish factoryship Slavjansk (19,000 gross tons), the 2nd of 8 such vessels of the same class for V/O Sudoimport in the Soviet Union. The first of the series was the Spassk launched January 14, 1965.

Both the Spassk and the Slavjansk have the following specifications: length between perpendiculars 160 meters (525 feet), breadth moulded 24 meters (79 feet), depth moulded 14.8 meters (48.5 feet), main diesel engine 5,500 brake horsepower at 125 r.p.m., cruising speed 14 knots, gross tonnage 19,000 tons, and deadweight tonnage 10,000 tons.

The Slavjansk will be equipped with modern equipment for fish freezing, canning, and salting. It will also have a reduction plant to process fish meal and oil. The new factoryship is expected to have a daily processing capacity of 350-400 metric tons of herring or 200-250 tons of groundfish such as cod and ocean perch.

## U.S.S.R. (Contd.):

The Slavjansk is scheduled for delivery to the Soviets in August 1965. (Fisheries Attache, United States Embassy, Tokyo, April 30, 1965.)

\* \* \* \* \*

### FREEZER-TRAWLER "GEIZER" DELIVERED TO SOVIETS BY DANISH SHIPYARD:

The 2,570-ton freezer-trawler M/S Geizer was delivered to Sudimport, Moscow, April 27, 1965. The vessel is another in a series of 15 freezer-trawlers for the U.S.S.R. being built by a Danish shipyard to the following spec-



M/S Geizer on trial run. Speed on loaded trials was 14 knots.

ifications: length between perpendiculars 91 meters (298.5 feet), breadth 16 meters (52.5 feet), and deadweight tonnage 2,550 to 2,600 tons. The first vessel in the series was the M/S Skryplev launched May 10, 1962. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, May 5, 1965.)

Note: See Commercial Fisheries Review, June 1965 p. 79; April 1965 p. 87; October 1964 p. 56.



## United Kingdom

### SUPPLY AND DISPOSITION OF FROZEN PROCESSED FISHERY PRODUCTS, 1963-1964 AND 1954:

British consumption of frozen processed fishery products in 1964 was up 8 percent from 1963, according to a report issued by the White Fish Authority, London. Since 1954, British consumption of frozen fishery products has increased more than fourfold.

Although production of frozen fishery products in Britain has more than doubled since 1954, the domestic supply has been insuffi-

British Supply and Disposition of Frozen Processed Fishery Products, 1964 with Comparisons			
	1964	1963	1954
	.....(Long Tons).....		
<b>SUPPLY:</b>			
Domestic Production:			
Institutional pack .....	29,890	27,445	1/
Consumer pack .....	30,941	30,617	1/
Total domestic production ..	60,831	58,062	25,929
Imports:			
Institutional pack .....	14,969	10,451	1/
Consumer pack .....	8,470	8,297	1/
Total imports .....	23,439	18,748	1,638
<b>DISPOSITION:</b>			
Domestic Consumption:			
Institutional pack .....	42,660	39,153	1/
Consumer pack .....	37,393	34,748	1/
Total domestic consumption ..	80,053	73,901	17,320
Exports <sup>2/</sup> :			
Institutional pack .....	7,293	7,385	1/
Consumer pack .....	4,149	4,003	1/
Total exports .....	11,442	11,388	8,008
1/Breakdown not available.			
2/Includes direct exports and also ship's stores (765 tons in 1964 and 922 tons in 1963) and consumption abroad by British Government personnel (646 tons in 1964 and 545 tons in 1963).			
Source: British White Fish Authority Economics and Statistics Branch, London.			

ent to meet the demand. As a result, imports have increased sharply, rising from 1,638 long tons in 1954 to 23,439 tons in 1964. British imports of frozen fishery products increased 25 percent from 1963 to 1964, due mainly to larger purchases of the bulk or institutional packs.

British exports of frozen processed fishery products have been much more stable, amounting to 8,008 tons in 1954 and increasing only moderately to 11,442 tons in 1964.

Note: See Commercial Fisheries Review, July 1964 p. 79.

\* \* \* \* \*

### GOVERNMENT SUBSIDY FOR FISHING VESSEL IMPROVEMENT:

The British Government has authorized grants of up to 30 percent of the cost of certain types of improvements to fishing vessels "holding out a clear promise of economic return." Details of the plan were announced April 2, 1965, by the White Fish Authority.

The types of improvement which qualify for assistance are those designed primarily to improve catching capacity and the handling of fish in the interests of quality and efficiency.

The scheme will assist owners who want to convert vessels for boxing fish at sea, and

### United Kingdom (Contd.):

will contribute--up to a maximum grant of £1,250 (US\$3,500)--to the cost of modifying trawl winches and winch drives.

It will apply to certain engine, propeller, and gear improvements to increase power when towing fishing gear.

The scheme will also apply to the fitting of fish-washing machines where this is not already fleet practice and where it is part of a more comprehensive and ambitious improvement project. It will help a fishing vessel owner insulate his fish holds and provide refrigeration, fit shelter decks, modify fuel stowage arrangements, strengthen his vessel for navigation in ice, and provide de-icing equipment.

It will also assist conversion from long-lining to trawling.

Grants may be approved for up to 25 percent of improvement costs on vessels of 80 feet or more, and up to 30 percent of cost on smaller craft. (*Fishing News*, London, April 9, 1965, and *Fish Trades Gazette*, April 10, 1965.)



### Republic of Viet-Nam

#### FISHERIES TRENDS, 1964 AND EARLY 1965:

The commercial fisheries catch in South Viet-Nam increased from 165,000 metric tons in 1959 to 342,775 tons in 1963 and 363,000 tons in 1964, according to preliminary data. The assistance of the United States Agency for International Development contributed to the increased landings. Vietnamese fisheries are believed to have a good potential for further development.

Considerable emphasis has been



placed on developing export markets for Vietnamese frozen shrimp, fresh fish, and processed fish in the form of dried, salted, and pickled products. Over the past several years export contracts for mackerel, pompano (spiny food-fish), threadfin, and other Vietnamese fishery products have been signed with commercial distributing firms in Singapore, Bangkok, and Hong Kong. Those fishery export contracts in 1964 had a value in excess of VN piastres 32.6 million (US\$448,260). In addition, pilot shipments of frozen shrimp were exported during 1964 to Hong Kong, Japan, France, the Netherlands, Switzerland, and the United States.

Exports of frozen shrimp during February 1965, as reported by the Vietnamese fisheries Directorate, amounted to 36.3 tons (including shipments to the United States of 20.3 tons, France 7.0 tons, Japan 8.0 tons, and Switzerland 1.0 tons). Exports of processed shrimp (other than frozen) in February 1965 included 3.5 tons shipped to France. (United States Embassy, Saigon, April 30, 1965.)

Note: See *Commercial Fisheries Review*, July 1964 p. 80, and July 1963 p. 96.



### Yugoslavia

#### RESULTS OF TUNA MARKET SURVEY BY JAPANESE:

In 1964 a survey of the Yugoslav tuna market was made by the Japanese Government agency, Japan External Trade Promotion Organization (JETRO). The survey report states, in part:

1. Yugoslavia has been purchasing frozen tuna from Japan and Turkey, but since 1963 Turkey has not supplied tuna to that country. In 1964 it was unofficially reported that Yugoslavia bought some tuna from Italy, but they are believed to be Japanese-caught fish.
2. Two firms monopolize tuna imports. One of the firms is tied up with 22 fish packing plants and is the only one engaged in exporting canned fishery products. The other firm operates two canneries, as well as retail stores.
3. Most of the canned fish production is exported. In 1964, only 8 percent of the production was diverted to the domestic market, consisting of low-quality packs, such as flake tuna and tuna in vegetable. Apparently, the

## Yugoslavia (Contd.):

Government is pursuing a policy of promoting exports to acquire foreign funds so as to pay for the cost of the imported raw material.

4. Canned fish exports in 1963 totaled 8,551 metric tons. Of that quantity, 1,324 tons were exported to Czechoslovakia, 1,156 tons to Italy, 953 tons to West Germany, and 934 tons to Austria. In 1964, only 5 percent of canned fish exports went to eastern Europe, with 95 percent going to western Europe. In 1965, it is anticipated that 20 percent of the exports will be destined for the Soviet Union.

5. To promote exports, the Government is allowing an exchange rate of 750 dinar for one U.S. dollar to pay for imported frozen tuna, 1,215 dinar to one dollar for canned fish exported to western Europe, and 1,140 dinar to one dollar for canned fish exported to eastern Europe. This is comparable to an export subsidy of approximately 62 percent. (Suisan Tsushin, April 27, 1965.)

Editor's Note: The official exchange rate based on the International Monetary Fund is 750 Yugoslav dinars equal one U. S. dollar.

Note: See Commercial Fisheries Review, October 1964 p. 81.

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## IMPORTS OF FISH MEAL AND OIL, 1962-1963 AND JANUARY-JUNE 1964:

Fish Meal: Yugoslav imports of fish meal increased sharply in January-June 1964 to 28,511 metric tons. Annual imports of fish meal amounted to only 23,387 tons in 1963 and 2,793 tons in 1962. Peru has been the leading supplier, accounting for total shipments in the first half of 1964 and also in the year 1962. In 1963, Peru supplied 19,387 tons and the United States shipped 4,000 tons.

Fish Oil: Yugoslav imports of inedible fish oil totaled 1,452 metric tons in the first half of 1964, as compared with annual imports of 1,640 tons in 1963 and 1,003 tons in 1962. Norway has been the main supplier with 1,120 tons of the total in January-June 1964 and 1,495 tons in the year 1963 and 670 tons in 1962, according to Yugoslav foreign trade statistics. (Agricultural Attache, United States Embassy, Belgrade, February 23, 1965.)



## OCTOPUS A DELICACY IN NEW CALEDONIA

There are plenty of octopuses in Noumea's market in September--that is the season when they are easily found in reef holes at low tide. Even so they bring a good price because many in New Caledonia (French island and territory in Southwest Pacific) consider them a great delicacy.

Preparation of an octopus for the table is a muscle-developing job as it entails thrashing the animal against a rock, preferably immersed coral which is glass-hard, for half an hour to an hour. Without this, you might as well serve up a dish of plastic garden hose, according to the New Caledonians.

When boiled, the meat is white and tender and tastes like spiny lobster. The skin and suckers easily slip off the cooked meat.

Octopus can be served up in many ways. It may be chopped up and served with "vinaigrette" sauce of vinegar, oil, and garlic; or chopped up and served with mayonnaise or the various sauces that go with spiny lobster.

One of the best ways of presenting octopus is in Coquilles St. Jacques--the meat is minced and mixed with bread crumbs, seasoning, and garlic, put into imitation shells and baked in the oven. (Pacific Islands Monthly, September 1964.)



# FEDERAL ACTIONS



## Civil Service Commission

### MINIMUM EDUCATIONAL REQUIREMENTS FOR FEDERAL OCEANOGRAPHY POSITIONS REVISED:

Previously approved minimum educational requirements for Federal government positions in the Oceanography Series, GS-1360, have been superseded and revised by the U. S. Civil Service Commission, in accordance with Section 5 of the Veterans' Preference Act of 1944, as amended.

Identification of the superseded requirements, the revised requirements, the duties

of the positions, and the reasons for the Commission's decision that the new requirements are necessary were published by the Commission in the Federal Register, May 26, 1965.

The former minimum educational requirements were established by the Commission and published in the Federal Register of August 28, 1964.

Complete details of the revised educational requirements for Federal oceanographer positions as published in the May 26, 1965, Federal Register follow:

## CIVIL SERVICE COMMISSION

### OCEANOGRAPHY SERIES

#### Minimum Educational Requirements

In accordance with section 5 of the Veterans' Preference Act of 1944, as amended, the Civil Service Commission has decided that previously approved minimum educational requirements for positions in the Oceanography Series, GS-1360, should be superseded by revised requirements. Identification of the superseded requirements, the revised requirements, the duties of the positions, and the reasons for the Commission's decision that these requirements are necessary are set forth below.

#### THE OCEANOGRAPHY SERIES, GS-1360 (ALL POSITIONS)

**Superseded requirements.** The following material supersedes that previously published in 29 F.R. 12407, August 28, 1964.

**Minimum educational requirements.** Candidates for these positions must have successfully completed A or B below:

A. A full 4-year course of study in an accredited college or university leading to a bachelor's degree with major study of at least 24 semester hours in oceanography or a related discipline such as physics, meteorology, geophysics, mathematics, chemistry, engineering, geology, or biology plus 20 semester hours in any combination of oceanography, physics, geophysics, chemistry, mathematics, meteorology, and engineering sciences.

B. Major study at least 24 semester hours in oceanography, or a related disci-

pline such as physics, meteorology, geophysics, mathematics, chemistry, engineering, geology, or biology plus 20 semester hours in any combination of oceanography, physics, geophysics, chemistry, mathematics, meteorology, and engineering sciences, combined with additional education and/or pertinent work experience in the field of oceanography totaling 4 years of education and experience. This combination of education and experience must have provided the candidate with professional knowledge and ability comparable to that required under paragraph A.

In either A or B above: Candidates who qualify on the basis of major study in biology or geology must show at least 6 semester hours in the major directly concerned with marine science, or in oceanography; candidates who qualify on the basis of other physical sciences or engineering, must show differential and integral calculus and at least 6 semester hours in physics.

Candidates for research positions must meet the requirements prescribed in paragraph A.

**Duties.** Oceanographers plan and conduct scientific surveys, and examine selected ocean data at sea or on land; they collect, analyze, evaluate, coordinate, and interpret information derived both scientifically and empirically from the ocean and its surroundings. Some oceanographers plan, organize, conduct and administer basic and applied research in laboratories at sea and on land. In general, these scientists are concerned with research on and studies of tides, sea ice, currents, waves and other ocean events in terms of their temperatures, densities, circulation, motion, sound propagation,

transparency, and similar characteristics. They are also concerned with the interaction and relationships between the ocean bottom, sea and atmosphere, including animal or plant life in the ocean, as these affect the particular ocean phenomena under study.

**Reasons for establishing requirements.** The duties of these positions cannot be performed successfully without formalized training either in oceanography or in a combination of the basic physical sciences which provide fundamental scientific knowledges applicable or adaptable to exploring, examining and understanding ocean phenomena. Oceanographers at the minimum must have a thorough knowledge of basic scientific methods and procedures which may be adapted to oceanographic work. Appointees must have the ability to apply their professional and scientific knowledge to their work in order to solve specific problems, interpret and apply the results of research (both in oceanography and in the applicable basic sciences), or do oceanographic research. These knowledges can be acquired only through the successful completion of a directed course of study in an accredited college or university which has scientific libraries, well equipped laboratories, and thoroughly trained instructors who can evaluate the progress of the professional and scientific training competently.

UNITED STATES CIVIL SERVICE COMMISSION,  
[SEAL] MARY V. WENZEL,  
Executive Assistant to  
the Commissioners.

Note: See Commercial Fisheries Review, November 1964 p. 116.

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## Department of the Interior

### FISH AND WILDLIFE SERVICE

#### PENALTIES PROPOSED FOR VIOLATION OF REGULATIONS UNDER FISHERY PRODUCTS INSPECTION PROGRAM:

Notice of a proposed amendment by the Secretary of the Interior to Title 50, Code of Federal Regulations, Part 260, Processed Fishery Products, on debarment and suspension of fishery products inspection services to persons guilty of violations, was published in the Federal Register, May 26, 1965.

## DEPARTMENT OF THE INTERIOR

### Fish and Wildlife Service

#### [ 50 CFR Part 260 ]

#### PROCESSED FISHERY PRODUCTS

##### Debarment and Suspension of Inspection Services

Notice is hereby given that pursuant to section 203 and 205 of Title II of the Agricultural Marketing Act of 1946, 60 Stat. 1087, 1090, as amended, 7 U.S.C. sections 1622 and 1624 (1958), as transferred to the Department of the Interior by section 6(a) of the Fish and Wildlife Act of 1956, 70 Stat. 1122 (1956), 16 U.S.C. section 742e (1958), the Secretary of the Interior proposes to amend Title 50, Code of Federal Regulations by addition and deletion of sections that specifically apply to debarment and suspension of inspection services.

Subsection (h) of section 203 of the Agricultural Marketing Act of 1946 (7 U.S.C. 1622(h)) provides criminal penalties for various specified offenses relating to official shields, marks or other identifications and devices for making such marks or identifications, issued or authorized under section 203 of said Act, and certain misrepresentations concerning the inspection or grading of fishery products under said section.

The purpose of these proposed changes is to suspend or debar any person from the benefits provided under the Act when such person engages in activities which are in violation of the criminal section of the Act or which abuse or adversely interfere with the successful conduct of the inspection program.

It is the policy of the Department of the Interior, whenever practicable, to afford the public an opportunity to participate in the rulemaking process. Accordingly, interested persons may submit written comments, suggestions, or objections with respect to the proposed amendment to the Director, Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Washington, D.C., 20240, within 30 days of the date of publication of this notice in the FEDERAL REGISTER.

The proposed addition and deletions of sections that specifically apply to debarment and suspension are as follows:

#### §§ 260.87, 260.89 [Deleted]

1. It is proposed that §§ 260.87 and 260.89 be deleted.

2. It is proposed that a new § 260.93 be added to read as follows:

#### § 260.93 Debarment and suspension.

(a) *Debarment.* Any person may be debarred from using or benefiting from the inspection service provided under the regulations of this subchapter or under the terms of any inspection contract, and such debarment may apply to one or more plants under his control, if such person engages in one or more of the following acts or activities:

(1) Misrepresenting, misstating, or withholding any material or relevant facts or information in conjunction with any application or request for an inspection contract, inspection service, inspection appeal, lot inspection, or other service, provided for under the regulations of this subchapter.

(2) Using on a processed product any label which displays any official identification, official device, or official mark, when the label is not currently approved for use by the Director or his delegate.

(3) Using on a processed product any label which displays the words "Packed Under the Continuous Inspection of the U.S. Department of the Interior," or which displays any official mark, official device, or official identification, or which displays a facsimile of the foregoing, when such product has not been inspected under the regulations of this subchapter.

(4) Making any statement or reference to the U.S. Grade of any processed product or any inspection service provided under the regulations of this subchapter on the label or in the advertising of any processed product, when such product has not been inspected under the regulations of this subchapter.

(5) Making, using, issuing, or attempting to issue or use in conjunction with the sale, shipment, transfer, or advertisement of a processed product any certificate of loading, certificate of sampling, inspection certificate, official device, official identification, or official mark which has not been issued, approved, or authorized for use with such product by an inspector.

(6) Using any of the terms "United States," "U.S.," "Officially graded," "Officially inspected," "Government inspected," or words of similar import or meaning, or using any official device, official identification, or official mark on the label, on the shipping container, or in the advertising of any processed product, when such product has not been

The purpose of the proposed amendments is to suspend or debar any person from the benefits provided under the Agricultural Marketing Act of 1946 when such person engages in activities which are in violation of the criminal section of the Act, or which abuse or adversely interfere with the successful conduct of the fishery products inspection program.

The notice of proposed amendment as published in the Federal Register, May 26, 1965, follows:

inspected under the regulations of this subchapter.

(7) Using or attempting to use any certificate, certificate form, design, insignia, mark, shield, device, or figure which simulates in whole or in part any official mark, official device, official identification, certificate of loading, certificate of sampling, inspection certificate, or other official certificate issued pursuant to the regulations of this subchapter.

(8) Interfering or obstructing or attempting to interfere or obstruct any inspector or sampler in the performance of his duties under the regulations of this subchapter.

(9) Violating any one or more of the terms of any inspection contract or the provisions of the regulations of this subchapter.

(10) Engaging in acts or activities which destroy or interfere with the purposes of the inspection program or which have the effect of undermining the integrity of the inspection program.

(b) *Temporary suspension.* Whenever the Director has reasonable cause to believe that any person has engaged in any act or activity described in paragraph (a) of this section, and such act or activity would, in the opinion of the Director, cause serious and irreparable injury to the inspection program and services provided under the regulation of this subchapter, the Director may, without a hearing, temporarily suspend, either before or after institution of a debarment hearing, the inspection service provided under regulations of this subchapter or under any inspection contract for one or more plants under the control of such person for a period not to exceed sixty (60) days, except as herein provided for under this subsection. Notice of suspension shall be served by registered or certified mail, return receipt requested, and the notice shall specifically state those acts or activities of such person which are the basis for the suspension. The suspension shall become effective five (5) days after receipt of the notice by such person. Objection may be taken to the suspension by the filing of a petition for reconsideration with the Director, and such petition may be accompanied by supporting and relevant evidence and affidavits. The petition for reconsideration shall be ruled upon by the Director within twenty (20) days after receipt of such petition.

(1) If a debarment hearing is instituted against any person under suspen-

sion, such suspension may, in the discretion of the Director, be extended beyond the sixty (60) day period and remain in effect until a final decision on the debarment is rendered in accordance with the regulations of this section. Failure to institute a debarment hearing during a suspension period shall not preclude the institution of such a hearing at a later date.

(2) If a debarment hearing is instituted against any person not under suspension, the Director may, in accordance with the regulations of this subsection, temporarily suspend such person, and the suspension may, in the discretion of the Director, be extended beyond the sixty (60) day period and remain in effect until a final decision on debarment is rendered in accordance with the regulations of this section.

(3) All temporary suspensions shall terminate upon the rendering of a final decision on debarment, upon the dismissal of a debarment hearing, or upon the expiration of the sixty (60) day period, unless the sixty (60) day period has been extended by the Director as herein provided for.

(c) *Hearing Examiner.* All hearings shall be held before a Hearing Examiner, appointed by the Secretary or the Director.

(d) *Hearing.* If one or more of the acts or activities described in paragraph (a) of this section have occurred, the Director may institute a hearing to determine the length of time during which the person shall be debarred and those plants to which the debarment shall apply. No person may be debarred unless there is a hearing, as prescribed in this section, and it has been determined by the Hearing Examiner, based on evidence of record, that the one or more of the activities described in paragraph (a) of this section have occurred. Any debarment or suspension must be instituted within two (2) years of the time when such acts or activities described in paragraph (a) of this section occurred.

(e) *Notice of hearing.* The Director shall notify such person of the debarment hearing by registered or certified mail, return receipt requested. The notice shall set forth the time and place of the hearing, the specific acts or activities which are the basis for the debarment hearing, the time period of debarment being sought, and those plants to which the debarment shall apply. The hearing will be set for a time not less than 30 days but not longer than 120 days after receipt of the notice of hearing.

(f) *Time and place of hearing.* The hearing shall be held at a time and place fixed by the Director; *Provided, however,* The Hearing Examiner may, upon a proper showing of inconvenience, change the time and place of the hearing. Motions for change of time or place of the hearing must be mailed to or served upon the Hearing Examiner no later than 10 days before the hearing.

(g) *Right to counsel.* In all proceedings under this section, all persons and the Department of the Interior shall have the right to be represented by counsel, in accordance with the rules and regulations set forth in Title 43, Code of Federal Regulation, Part 1.

(h) *Form, execution, and service of documents.* (1) All papers to be filed under the regulations in this section shall be clear and legible; and shall be

dated, signed in ink, contain the docket description and title of the proceeding, if any, and the address of the signatory. Five copies of all papers are required to be filed. Documents filed shall be executed by (i) the person or persons filing same, (ii) by an authorized officer thereof if it be a corporation or, (iii) by an attorney or other person having authority with respect thereto.

(2) All documents, when filed, shall show that service has been made upon all parties to the proceeding. Such service shall be made by delivering one copy to each party in person or by mailing by first-class mail, properly addressed with postage prepaid. When a party has appeared by attorney or other representative, service on such attorney or other representative will be deemed service upon the party. The date of service of document shall be the day when the matter served is deposited in the U.S. mail, shown by the postmark thereon, or is delivered in person, as the case may be.

(3) A person is deemed to have appeared in a hearing by the filing with the Director a written notice of his appearance or his authority in writing to appear on behalf of one of the persons to the hearing.

(4) The original of every document filed under this section and required to be served upon all parties to a proceeding shall be accompanied by a certificate of service signed by the party making service, stating that such service has been made upon each party to the proceeding. Certificates of service may be in substantially the following form:

I hereby certify that I have this day served the foregoing document upon all parties of record in this proceeding by: (1) Mailing postage prepaid, (2) delivering in person, a copy to each party.

Dated at \_\_\_\_\_ this \_\_\_\_\_ day of \_\_\_\_\_ 19\_\_\_\_  
Signature \_\_\_\_\_

(i) *Procedures and evidence.* (1) All parties to a hearing shall be entitled to introduce all relevant evidence on the issues as stated in the notice for hearing or as determined by the Hearing Examiner at the outset of or during the hearing.

(2) Technical rules of evidence shall not apply to hearings conducted pursuant to this section, but rules or principles designed to assure production of the most credible evidence available and to subject testimony to test by cross-examination shall be applied where reasonably necessary.

(j) *Duties of Hearing Examiner.* The Hearing Examiner shall have the authority and duty to:

(1) Take or cause depositions to be taken.

(2) Regulate the course of the hearings.

(3) Prescribe the order in which evidence shall be presented.

(4) Dispose of procedural requests or similar matters.

(5) Hear and initially rule upon all motions and petitions before him.

(6) Administer oaths and affirmations.

(7) Rule upon offers of proof and receive competent, relevant, material, reliable, and probative evidence.

(8) Control the admission of irrelevant, immaterial, incompetent, unreliable, repetitious, or cumulative evidence.

\* \* \* \* \*

(9) Hear oral arguments if the hearing examiner determined such requirement is necessary.

(10) Fix the time for filing briefs, motions, and other documents to be filed in connection with hearings.

(11) Issue the initial decision and dispose of any other pertinent matters that normally and properly arise in the course of proceedings.

(12) Do all other things necessary for an orderly and impartial hearing.

(k) *The record.* (1) The Director will designate an official reporter for all hearings. The official transcript of testimony taken, together with any exhibits and briefs filed therewith, shall be filed with the Director. Transcripts of testimony will be available in any proceeding under the regulations of this section, at rates fixed by the contract between the United States of America and the reporter. If the reporter is an employee of the Department of the Interior, the rate will be fixed by the Director.

(2) The transcript of testimony and exhibits, together with all briefs, papers, and all rulings by the Hearing Examiner shall constitute the record. The initial decision will be predicated on the same record, as will the final decision.

(l) *Decisions.* (1) The Hearing Examiner shall render the initial decision in all debarment proceedings before him. The same Hearing Examiner who presides at the hearing shall render the initial decision except when such Examiner becomes unavailable to the Department of the Interior. In such case, another Hearing Examiner will be designated by the Secretary or Director to render the initial decision. Briefs, or other documents, to be submitted after the hearing must be received not later than twenty (20) days after the hearing, unless otherwise extended by the Hearing Examiner upon motion by a party. The initial decision shall be made within sixty (60) days after the receipt of all briefs. If no appeals from the initial decision is served upon the Director within ten (10) days of the date of the initial decision, it will become the final decision on the twentieth day following the date of the initial decision. If an appeal is received, the appeal will be transmitted to the Secretary who will render the final decision after considering the record and the appeal.

(2) All initial and final decisions shall include a statement of findings and conclusions, as well as the reasons or bases therefor, upon the material issues presented. A copy of each decision shall be served on the parties to the proceeding, and furnished to interested persons upon request.

(3) It shall be the duty of the Hearing Examiner, and the Secretary where there is an appeal, to determine whether the person has engaged in one or more of the acts or activities described in paragraph (a) of this section, and, if there is a finding that the person has engaged in such acts or activities, the length of time the person shall be debarred, and the plants to which the debarment shall apply. However, the Hearing Examiner may not terminate any temporary suspension imposed by the Director.

JOHN A. CARVER, Jr.,  
Under Secretary of the Interior.

MAY 21, 1965.

# **VESSEL DEFINITION AMENDMENT PROPOSED UNDER FISHING VESSEL MORTGAGE INSURANCE PROCEDURES:**

Notice of a proposed amendment to Title 50, Code of Federal Regulations, Part 255, was published in the Federal Register, April 30, 1965. The proposed amendment would revise paragraph (a) of Sec. 255.2 (Fishing Vessel Mortgage Insurance Procedures) to read:

(a) Fishing vessel. The term "fishing vessel" includes any vessel documented or to be documented as a fishing vessel of the United States which is designed to be used in catching fish, processing or transporting fish loaded on the high seas, or any vessel outfitted for such activity.

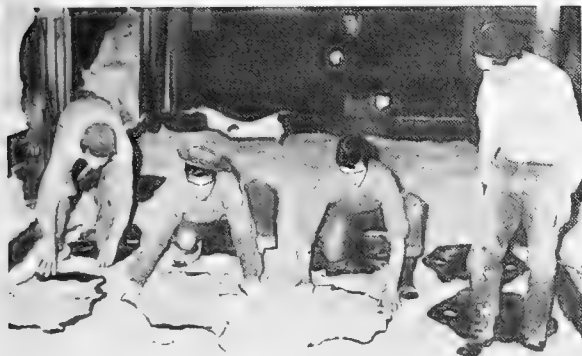
The purpose of the proposed revision is to change the definition of fishing vessel in the mortgage insurance regulations to conform with the definition provided for in the United States Fishing Fleet Improvement Act.

The proposed amendment relates to matters which are exempt from the rule making requirements of the Administration Procedure Act. However, interested persons were given until May 29, 1965, to submit written comments, suggestions, or objections with respect to the proposed amendment.

## **BUREAU OF COMMERCIAL FISHERIES**

### **CONTRACT AWARDED FOR PROCESSING, PROMOTING, AND SELLING ALASKA SEAL SKINS:**

A contract for processing, promoting, and selling Alaska seal skins for the account of



Salting fur seal skins on St. Paul Island, Alaska.

the United States Government has been awarded the Fouke Fur Company, Greenville, S. C., announced Secretary of the Interior Stewart

L. Udall, May 7, 1965. A Letter of Intent covering the contract was issued by the Interior Department, March 31. The new agreement is based on a proposal filed by the company in April 1964.

The Interior Secretary said the new pact is based on two major considerations. One provides that seven-eighths of the United States share of the raw seal skins harvested by the United States at the Pribilof Island rookeries from 1963-1967 will be delivered to the Fouke Company. The other relates to the retention of one-eighth of the skins by the Government for use in experimental processing contracts with other interested firms. Skins harvested in 1963 and 1964 were stored in Seattle, Wash., until terms of the new contract were reached.

Secretary Udall said the Interior Department continues to be concerned with improving processing techniques as well as developing competitive "know-how" in the handling of seal skins. "Therefore, we are having up to one-eighth of the skins retained by the Government for use in experimental processing and marketing contracts with other interested firms," he said. The Interior Department's Bureau of Commercial Fisheries, which manages the Pribilof Island herds, has invited proposals for experimental processing and qualified firms had until May 17, 1965, to respond.

The new Alaska seal skin contract authorizes the Fouke Fur Company to conduct the semiannual fur seal auctions through the spring of 1970.

Under terms of the North Pacific Fur Seal Conservation Convention, Canada and Japan each receive 15 percent of the annual seal skin harvest, including skins taken at rookeries managed by the Soviet Union. All four Convention countries are responsible for protecting the fur seals during their extensive migrations on the high seas.

Note: See Commercial Fisheries Review, September 1964 p. 20; June 1964 p. 63.



## **Interstate Commerce Commission**

### **TRUCK DETENTION CHARGES SET FOR THE NORTHEAST:**

A final order was served May 7, 1965, by the Interstate Commerce Commission in I. C. C. Docket No. 33434, "Detention of Motor Vehicles--Middle Atlantic and New England Terri-

tory." Discussing the order, the Commission said, in part, "The purpose of the . . . detention rule is to discourage delays of carriers' vehicles at origins, stopoff points,



and destinations. The rule is not designed, as such, as a source of revenue. It is essentially an effort to reach unreasonable delays of carrier vehicles attributable to consignors, consignees, or their representatives . . . ."

The order established detention rules and charges that will apply in the Middle Atlantic territory (except New York short-haul territory), and between the Middle Atlantic and New England territories. The rule will not apply on household goods, commodities transported in bulk in tank trucks and in dump trucks, articles transported by heavy haulers, or articles picked up from or delivered to railroad cars; nor to the transportation of palletized shipments to the extent such shipments are subject to another rule.

Under the new detention rules, carriers were ordered to file amended tariffs with the Interstate Commerce Commission not later than July 5, 1965. After filing by the carriers, an additional notice to the public of at least 30 days is required before the new charges become effective.

Following are the new detention rules and charges:

#### DETENTION OF VEHICLES

This rule applies when carriers' vehicles ("vehicles" as used in this rule means straight trucks or tractor-trailer combinations, except that this rule will not apply to trailers without power units left by carrier at place of pickup or delivery of consignor, consignee, or other party designated by them) are delayed or detained at premises of consignor, consignee, or other places designated by consignor or consignee, subject to the following provisions:

#### SECTION I--GENERAL PROVISIONS

(a) This rule applies only to vehicles which have been ordered or used to transport shipments subject to truckload rates. If the shipment is moving on a rate subject to a stated minimum weight of 12,000 pounds or more, and such rate is not designated as a truckload rate, it will be considered a truckload rate for the purpose of applying this rule.

(b) This rule applies only when vehicles are delayed or detained at the places of pickup or delivery and only when such delay or detention is attributable to consignor, consignee, or others designated by them.

(c) Free time for each vehicle will be as provided in Section III.

(d) After the expiration of free time as herein provided, charges as provided in Section IV will be assessed against the shipment.

#### SECTION II--COMPUTATION OF TIME

(a) The time per vehicle shall begin to run upon notification by the driver to the responsible representative of the consignor or consignee at the place of pickup or delivery of the arrival of the vehicle for loading or unloading, as the case may be, either on the premises designated by the consignor or consignee, or as close thereto as conditions on said premises will permit, and shall end upon completion of loading or unloading and receipt by the driver of a signed bill of lading or receipt for delivery, as the case may be, except as provided in paragraph (b) of this section. Time, if any, necessary to prepare a vehicle for loading or unloading, as the case may be, will be excluded from the computation of time.

Upon request of consignor or consignee, or others designated by them, carrier will enter into a reasonable prearranged schedule for arrival of the vehicle for loading or unloading.

Exception--When carrier makes a prearranged schedule with consignor or consignee, or others designated by them, at place of pickup or delivery for the arrival of the vehicle for loading or unloading and carrier is unable for any reason to maintain such schedule within 30 minutes, the time shall begin to run from the commencement of loading or unloading and not from the time of arrival of the vehicle. If carrier's vehicle arrives prior to scheduled time, the time shall begin to run from the scheduled time or actual time loading or unloading commences, whichever is earlier.

(b) Computations of time are subject to, and are to be made within the normal business (shipping or receiving) day at the designated premises at place of pickup or delivery, except, if carrier is permitted to work beyond this period, such working time shall also be in-

cluded. When loading or unloading is not completed at the end of such day, time will be resumed at the beginning of the next such day, or when work the next is actually begun by carrier, if earlier. When loading or unloading carries through a normal meal period, meal time, not to exceed one hour, will be excluded from computation of time.

### SECTION III--FREE TIME

Free time shall be as follows:

Column A		Column B	
Actual Weight in Pounds per Vehicle	Free Time in Minutes	Actual Weight in Pounds per Vehicle Stop	Free Time in Minutes per Vehicle Stop
Less than 24,000	240	Less than 10,000	90
24,000 and less than 36,000 . .	300	10,000 and less than 20,000 . .	180
36,000 or more	360	20,000 and less than 24,000 . .	240
		24,000 and less than 36,000 . .	300
		36,000 or more	360

Note: Column A - applies to vehicles containing truckload shipments requiring only one vehicle, or to fully loaded vehicles containing truckload shipments requiring more than one vehicle, except as provided in Column B.

Column B - applies to last vehicle used in transporting overflow truckload shipments requiring two or more vehicles, or to vehicles containing truckload shipments stopped for completion of loading or partial unloading.

### SECTION IV--CHARGES

When the Delay per Vehicle Beyond Free Time is:	The Charge for Vehicle will be:
1 hour or less . . . . .	\$10.00
Over 1 hour but not over 75 minutes . . .	12.50
Over 75 minutes but not over 90 minutes .	15.00
Over 90 minutes but not over 105 minutes	17.50
Over 105 minutes but not over 120 minutes	20.00
Over 120 minutes but not over 135 minutes	22.50
Over 135 minutes but not over 150 minutes	25.00
Over 150 minutes but not over 165 minutes	27.50
Over 165 minutes but not over 180 minutes	30.00
Over 180 minutes . . . . .	1/
1/\$30.00 plus \$2.50 for each 15 minutes or fraction thereof over 180 minutes.	

### SECTION V

A record of the following information must be maintained by the carriers and kept available at all times:

(a) Name and address of consignor, consignee, or other party at whose place of business freight is loaded or unloaded.

(b) Identification of vehicles tendered for loading or unloading.

(c) Date and time of notification of the arrival of the vehicle for loading or unloading.

(d) Date and time loading or unloading begins.

(e) Date and time loading or unloading is completed.

(f) Date and time vehicle is released for departure by consignor, consignee, or by other party at place of pickup or delivery after loading or unloading is completed.

(g) Total actual weight of shipment loaded or unloaded.

(h) Whether vehicles are tendered under a prearranged schedule for loading or unloading.

(i) When vehicles are tendered under a prearranged schedule for loading or unloading, date and time specified therefor.

### SECTION VI

Nothing in this rule shall require a carrier to pick up or deliver freight at hours other than such carrier's normal business hours.

Note: See Commercial Fisheries Review, March 1965 p. 98.



## Department of Labor

### WAGE AND HOUR AND PUBLIC CONTRACTS DIVISIONS

### HEARINGS TO BE HELD ON INDUSTRY WAGE RATES IN AMERICAN SAMOA:

An Industry Committee was appointed by the Secretary of Labor to recommend minimum hourly wage rates under the Fair Labor Standards Act for all industries in American Samoa. The committee began its public hearings on July 12, 1965, in Pago Pago, American Samoa.

Present minimum wage rates in American Samoa are \$1.00 an hour for workers engaged in fish canning and processing. Tuna canneries there will be included in the hearings since the minimum wage for tuna canneries in American Samoa is less than the mainland minimum wage.

The Act authorizes such committees to recommend for American Samoan industries minimum hourly wage rates at or below the statutory minimum rates that apply on the mainland. Composed of residents of both American Samoa and the Continental United States, these committees are equally representative of employers, employees, and the public.

The formal notice of appointment by the Secretary of Labor was published in the Federal Register, May 4, 1965.

Note: See Commercial Fisheries Review, March 1965 p. 100.



## Department of the Treasury

### BUREAU OF CUSTOMS

#### TUNA CANNED IN BRINE IMPORT QUOTA FOR 1965:

The quantity of tuna canned in brine which may be imported into the United States during calendar year 1965 at the 12½-percent rate of duty is limited to 66,059,400 pounds (or about 3,145,685 standard cases of 48 7-oz. cans). This is 8.5 percent more than the 60,911,870 pounds (about 2,900,565 cases) in 1964; 4.6 percent more than the 63,130,642 pounds (about 3,006,221 cases) in 1963; 11.9 percent over the 59,059,014 pounds (about 2,812,000 cases) in 1962; and 15.7 percent more than the 57,114,714 pounds in 1961. Compared with the 53,448,330-pound limit in 1960, the 1965 quota is 23.6 percent greater and is 26.1 percent more than the 52,372,574-pound limit set in 1959. Any imports of tuna canned in brine in excess of the 1965 quota will be dutiable at 25 percent ad valorem under item 112.34, Tariff Schedules of the United States.

The quota for 1965 is based on the United States pack of canned tuna during the preceding calendar year (1964), as reported by the U. S. Fish and Wildlife Service.

The 1965 tariff-rate quota was published in the Federal Register, page 5799, April 24, 1965, by the Bureau of Customs of the U. S. Department of the Treasury.

Note: See Commercial Fisheries Review, June 1964 p. 64.



## Eighty-Ninth Congress (First Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and



allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.

**ANADROMOUS FISH CONSERVATION:** Subcommittee on Merchant Marine and Fisheries of Senate Committee on Commerce, May 11-12, 1965, held hearings on S. 909, to authorize the Secretary of the Interior to initiate with several States a cooperative program for the conservation, development, and enhancement of the Nation's anadromous fish, and for other purposes (see "FISHERIES LEGISLATION, 1965").

Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries held hearings June 2-3, 1965, on H. R. 3927, similar to S. 909.

**ANTIDUMPING ACT AMENDMENT:** S. 2045 (Harte and 22 others) introduced in Senate May 26, 1965, to amend the Antidumping Act, 1921; to Committee on Finance. Same day 88 bills were introduced in House (H. R. 8510-H. R. 8597); also H. R. 8275 (Cederberg) May 19; H. R. 8619 (Flood) May 27; H. R. 8705 (Baring), H. R. 8711 (Pool), H. R. 8717 (Green of Pa.), June 2; and H. R. 8776 (Byrne of Pa.) June 3; to Committee on Ways and Means. Rep. Herlong in Congressional Record, May 26, 1965 (pp. 11260-11264) pointed out that the 1965 Antidumping Act Amendment would clarify standards to be applied by the Treasury Department and the Tariff Commission in their respective "dumping" and "injury" determinations; tighten loopholes which have been discovered and exploited over the years; assure fairer, more effective procedures in the administration of the Act; accommodate some opposition views; ratify recent Treasury regulations on its dumping functions where these are not inconsistent with the Act as it would be amended.

H. Res. 405 (Curtis) introduced in House June 1, 1965, expressing the sense of the House that the President should take such action as may be necessary for the preparation of an international agreement to harmonize the operation and administration of the antidumping laws of all the countries; to Committee on Ways and Means.

Rep. Curtis, in extension of remarks in Congressional Record, June 1, 1965 (pp. 11645-11647) said that the proposed changes in the U. S. antidumping program would not advance the goal of fairer and increased international trade. He stated that as one of four congressional members of the U. S. delegation to the current GATT negotiations, he was particularly concerned with the international trade problems posed by the present administration of the U. S. antidumping program.

**AQUATIC PLANT CONTROL:** Hearings held May 18, 1965, by the Senate Committee on Public Works on S. 1380, to provide for the control of obnoxious aquatic plants in navigable and allied waters.

Introduced in House, H. R. 8395 (Sickles) May 24, 1965; H. R. 8656 May 28; similar to S. 1380.

**COMMODITY PACKAGING AND LABELING:** Senate Committee on Commerce, May 17, 1965, resumed its hearings on S. 985, to prevent unfair or deceptive



methods of packaging or labeling of commodities distributed in interstate commerce. Hearings concluded May 18.

Introduced in House H. R. 8475 (McGrath) May 26, H. R. 8764 (Helstoski) June 3, 1965; to Committee on Interstate and Foreign Commerce; similar to S. 985.

**FISHERIES LOAN FUND AMENDMENT:** House May 12, 1965, and Senate May 13, 1965, received a letter from the Secretary of the Interior, transmitting a draft of proposed legislation to amend section 4 of the Fish and Wildlife Act of 1956 to authorize the Secretary of the Interior to make loans for the financing and refinancing of new and used fishing vessels; in House to Committee on Merchant Marine and Fisheries; in Senate to Committee on Commerce.

S. 2013 (Magnuson) introduced in Senate May 21, 1965, to amend section 4 of the Fish and Wildlife Act of 1956; to Committee on Commerce. Sen. Magnuson in Congressional Record, May 21, 1965 (p. 10801), pointed out that the proposal authorizes the Secretary of the Interior to make loans for, among other things, the purchase or construction of a commercial fishing vessel without regard to whether the vessel will replace an existing vessel. Proposal does not continue the unused authority to make loans for research into the basic problems of the fisheries.

**FISHERIES LEGISLATION, 1965** (Pacific Salmon Conservation, Fishery Loan Fund Extension, and Conservation and Development Program for Anadromous Fish): Hearings before the Merchant Marine and Fisheries subcommittee of the Committee on Commerce, United States Senate, 89th Congress, 1st session on S. 909, to authorize the Secretary of the Interior to initiate a program for the conservation, development, and enhancement of the Nation's anadromous fish in cooperation with the several states, S. 998, to extend the term during which the Secretary of the Interior is authorized to make fishery loans under the Fish and Wildlife Act of 1956, and for other purposes, and S. 1734, to conserve and protect Pacific Salmon of North American origin, Serial 89-10, May 11-12, 1965, 194 pp., printed. Contents include texts and departmental reports (Agriculture, Interior, Justice, Treasury, Comptroller General), agency comments, statements and letters of various Federal and state officials, business officials, and organizations and associations.

**FISHERIES LOAN FUND EXTENSION:** Subcommittee on Merchant Marine and Fisheries of Senate Committee on Commerce, May 11-12, 1965, held hearings on S. 998, extending and liberalizing terms of fisheries loans which may be made under the Fish and Wildlife Act (see "FISHERIES LEGISLATION, 1965"). Senate Committee on Commerce, May 24, 1965, approved for reporting S. 998.

Hearings held by Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries May 26, 1965, on H. R. 4227, similar to S. 998. Subcommittee in executive session May 27, ordered bill reported favorably to the full committee.

H. R. 8657 (King of Calif.) introduced in House May 28, 1965; to Committee on Merchant Marine and Fisheries; similar to H. R. 4227.

**FISHING VESSEL REPLACEMENT RESERVE FUND:** Rep. Keith in Congressional Record, May 12, 1965 (pp.

A2347-A2348) pointed out, among other things, that his bill H. R. 7956 is a companion bill to Sen. Bartlett's S. 1858. This legislation would extend to the nonsubsidized portion of the merchant fleet and the fishing industry, the same tax privileges now enjoyed by subsidized operators. That is, to allow them to establish tax-deferred capital reserve funds for rebuilding old vessels or building badly needed new ones.

Introduced in House, H. R. 8495 (Garmatz) May 26, and H. R. 8722 (Rivers of Alaska) June 3, 1965; to Committee on Merchant Marine and Fisheries; similar to H. R. 7956.

**FOOD MARKETING NATIONAL COMMISSION:** National Commission on Food Marketing Extension of Time to File Report: Hearing before the Committee on Agriculture, House of Representatives, 89th Congress, 1st session, on H. R. 5720, March 25, 1965, Serial G, 29 pp., printed. Contents include statements and correspondence of various Federal officials, associations, and the National Commission on Food Marketing.

H. R. 5702 (extending for 1 year, to 1966, the date on which the National Commission on Food Marketing shall make its final report to the President and the Congress) was signed May 15, 1965, by the President (P. L. 89-20). Fund authorization increased from \$1.5 million to \$2.5 million.

Rep. Sullivan in Congressional Record, May 18, 1965, (pp. A2472-A2474) inserted an article from the May 15, 1965, issue of Business Week, entitled "Marketing: Why Farmer's Share Is Shrinking--Food Marketing Commission Has Started A Sweeping Study of the Food Industry--Its Goal: To Find Out Why Costs to Consumers Go Up, Return to Farmers Go Down." Article gives an objective report on the reason for the Commission's establishment and the methods being followed in the development of their study.

**HALIBUT COMMISSION:** S. 1975 (Magnuson) introduced in Senate May 14, 1965, to amend the Northern Pacific Halibut Act in order to provide certain facilities for the International Pacific Halibut Commission; to Committee on Commerce. Sen. Magnuson in Congressional Record, May 14, 1965 (p. 10132) said that the purpose is to authorize the construction of quarters for the Halibut Commission on or adjacent to the University of Washington campus. He inserted a letter from the Department of State endorsing this proposal.

**HALIBUT WEEK:** Sen. Magnuson May 7, 1965, submitted a concurrent resolution (S. Con. Res. 34) authorizing and requesting the President of the United States to proclaim May 15 to May 21 as National Halibut Week; to Committee on the Judiciary.

**HEALTH, EDUCATION AND WELFARE APPROPRIATIONS, FY 1966.** House Committee on Appropriations reported favorably (H. Rept. 272) Apr. 29, 1965, H. R. 7765. As reported allows additional funds for the Federal water pollution control program. House passed bill May 4, 1965, and referred it to the Senate Committee on Appropriations May 5.

**HIGHWAYS AND FISH AND WILDLIFE PROTECTION:** Introduced in Senate S. 1974 (Metcalf and 2 others), May 14, 1965; S. 2074 (Scott) June 2, to amend title 23 of the United States Code relating to highways for the purpose of protecting fish and wildlife and recreation resources; to Committee on Public Works. Sen. Metcalf in Congressional Record, May 14, 1965 (p. 10131), stated the

purpose is to protect fish and wildlife and recreation resources and to make uniform the sound and wise procedures which have been outlined by the Federal Highway Administrator in his instructions to the Bureau of Public Roads. The bill would require that the Secretary of any other Federal department consult with the Secretary of the Interior to determine that the surveys, plans, specifications, and estimates for any project constructed with Federal funds are satisfactory in the interests of conserving fish and wildlife and recreation resources, in the area of the proposed project.

**IMPORT RESTRICTIONS ON FISHERY PRODUCTS:** Subcommittee on Merchant Marine and Fisheries of Senate Committee on Commerce held hearings May 11-12, 1965, on S. 1734, to conserve and protect North Pacific salmon. (see "FISHERIES LEGISLATION, 1965").

Senate Committee on Commerce, May 18, 1965, in executive session, ordered favorably reported S. 1734. Committee reported (S. Rept. 194) bill to Senate May 19.

S. Rept. 194, Conservation of U. S. Fishery Resources (May 18, 1965, report from the Committee on Commerce, U. S. Senate, 89th Congress, 1st session, to accompany S. 1734), 7 pp., printed. Committee reported bill favorably with amendments. Discusses purpose, general discussion, committee consideration, opposition to the bill, cost of the legislation, agency comments, and changes in existing law.

Senate May 19, 1965 passed with committee amendments S. 1734. (Before amendment referred to "North Pacific Salmon.") Motion to reconsider was tabled. Sen. Magnuson in Congressional Record, May 19, 1965 (pp. 10592-10595), inserted a table showing U. S. imports of fishery products from Japan by commodity for 1963--amounted to almost \$100 million. Bill as amended provides that whenever the Secretary of Interior determines that fishing vessels of a foreign country are being operated to the detriment of the domestic fishery conservation programs, the President may increase duty--up to 50 percent of the July 1, 1934, level--on any fishery product in any form from the offending country. (Previously shown under "Salmon Import Restriction.")

By a voice vote the House May 20, 1965, adopted H. Res. 397, providing for the return to the Senate of S. 1734 on the basis that the bill "contravenes the first clause of the seventh section of the first article of the Constitution of the United States, and is an infringement of the privileges" of the House.

House Committee on Ways and Means announced May 24 that as soon as its schedule will permit, it will consider legislation introduced by a number of House Members designed to conserve and protect Pacific salmon of North American origin. Several such bills (H. R. 7187, H. R. 7269, H. R. 7483, and H. R. 7661) are now pending in the Committee. The Chairman stated that a number of Members of Congress had expressed concern that fishing vessels of foreign origin are being used or may be used in the conduct of their fishing operations in a manner or under circumstances which diminish the effectiveness of domestic conservation programs of Pacific salmon of North American origin, and had requested that appropriate legislative action be taken to conserve and protect this American natural resource. No specific date set.

**INTERIOR DEPARTMENT:** Senate Committee on Commerce, May 18, 1965, in executive session, ordered favorably reported the nomination of Stanley A. Cain, of Michigan, to be Assistant Secretary of the Interior for Fish and Wildlife.

Senate May 19, 1965, confirmed the nomination of Stanley A. Cain.

**INTERIOR DEPARTMENT APPROPRIATIONS: FY 1966:** By unanimous vote May 26, 1965, Senate passed with amendments H. R. 6767, fiscal 1966 appropriations for the Department of the Interior and related agencies after adopting committee amendments en bloc, which were thereafter considered as original text for purpose of further amendment. Senate insisted on its amendments, asked for conference with House, and appointed conferees. Sen. Proxmire in Congressional Record, May 26, 1965 (p. 11348) commended the subcommittee for its consideration of the problems being faced by the Great Lakes' declining fishing industry--the subcommittee set aside \$400,000 for an accelerated development program, and the full committee added an additional \$30,000 in recognition of the losses that have taken place over the past two years. Same day Sen. Bartlett (p. 11349) stated that the committee also approved \$300,000 for disaster research under Federal aid for fishery research development, in addition to \$100,000 voted by the House for oyster disease research in the four Mid-Atlantic States.

**NORTH AMERICAN FISHERIES CONFERENCE:** Sen. Bartlett in Congressional Record, May 27, 1965 (pp. 11472-11477), inserted the remarks of Donald L. McKernan, Director of U. S. Bureau of Commercial Fisheries, summarizing the papers presented at the North American Fisheries Conference Apr. 30 through May 5, 1965.

**NORTH PACIFIC FISHERIES CONVENTION:** Sen. Bartlett (Congressional Record, June 7, 1965, pp. 12244-12245) in the Senate discussed Japanese violation of the 1953 North Pacific Fisheries Convention--Japanese fishing vessels early in June were sighted east of 175° west longitude, and one vessel was seized by the U. S. Coast Guard.

**OCEANOGRAPHY SEA-GRANT COLLEGES:** Sen. Pell (Congressional Record, May 7, 1965, pp. 9567-9569) spoke in the Senate concerning the need for more research and development of the oceans, calling for initial support of Federal and State governments. He presented an idea which he feels is a necessity for the survival of the fishing industry--sea-grant colleges, similar in concept to the land-grant colleges which have done so much for agriculture. Within the sea-grant universities could be colleges of aquaculture, marine aquacultural experiment stations, fishery extension services, and seagoing fishing port agents.

**OIL POLLUTION OF THE SEA, 1961:** Introduced in Senate S. 2017 (Magnuson) May 24, to Committee on Commerce; introduced in House H. R. 8760 (Garmatz) June 3, 1965; to Committee on Merchant Marine and Fisheries; to amend the provisions of the Oil Pollution Act, 1961 (33 U. S. C. 1001-1015), to implement the provisions of the International Convention for the Prevention of the Pollution of the Sea by Oil, 1954, as amended, and for other purposes; to Committee on Commerce.

Sen. Magnuson in Congressional Record, May 24, 1965 (pp. 10946-10947), pointed out that the proposed amendments to the Act would redefine the types and sizes of ships regulated, redefine the extent to which

ships must record the discharge of oil, extend the zones in which discharge of oil is prohibited, and make other necessary changes. Would bring existing statutory provisions into agreement with the 1954 Convention. Would revise the scope of application, so that the law applies to all seagoing vessels of any type whatsoever of American registry or nationality except--(a) tankers under 150 gross tons and other ships of under 500 gross tons; (b) ships in the whaling industry when actually employed on whaling operations; (c) ships navigating the Great Lakes and tributary waters as specified; and (d) naval ships and ships for the time being used as naval auxiliaries.

**ORDERLY MARKETING ACT 1965:** S. 2022 (Muskie and 8 others), introduced in Senate May 24, 1965, to provide for the orderly marketing of articles imported into the United States, to establish a flexible basis for the adjustment by the U. S. economy to expanded trade, and to afford foreign supplying nations a fair share of the growth or change in the U. S. market; to Committee on Finance. Sen. Muskie in Congressional Record, May 24, 1965 (pp. 10955-10957), said that the proposed legislation, "The Orderly Marketing Act of 1965," is designed to protect those industries injured or threatened with injury by a massive flood of low-cost imports. This orderly marketing concept would allow us to "overcome unfair competition, through international agreements or through unilateral--but flexible--quotas. And it allows foreign competitors to share in the growth of our economy . . ." Section 3 outlines the procedure for filing petitions for relief under the Orderly Marketing Act. In addition, subsection (b) provides that a determination is to be made whether increased quantities of imports are a factor contributing to a condition of economic impairment. The determination of whether or not increased imports are a "factor" in creating such a condition is made conclusive by subsection (b). Two standards are adopted, both of which must exist in order for an affirmative determination to be made: (1) Imports must have increased by more than 50 percent in the aggregate during the 5 calendar years immediately preceding the filing of the petition; and (2) Imports must equal or exceed 15 percent of domestic production during the calendar year immediately preceding the filing of the petition. Section 5 provides for the imposition of orderly marketing limitations in the event of an affirmative finding by the Secretary of Commerce under subsection 3(e). The quotas are to be established on one or two bases, either at an annual level equal to 15 percent of domestic production for the preceding year or at the average annual level of importation for the 5 years immediately preceding the proclamation. Section 5 offers the President an alternative to proclaiming the quantitative limitations specified in section 4. The alternative contemplates negotiations with principal foreign supplying nations whereby import levels would be established, and in connection with this alternative the most-favored-nation principle is abandoned. Section 6 creates a mechanism for allocation of U. S. import quotas among countries, generally on a historic level. Further relief would be available under section 7 of the orderly marketing bill. This provision permits automatic certification of firms and workers in an industry as to which a proclamation limiting imports has been made whereby they might apply for adjustment assistance as under title III of the Trade Expansion Act.

Introduced in House, H. R. 8426 (Bates), H. R. 8428 (Burke) and H. R. 8449 (Philbin) May 25, 1965; H. R. 8474 (Keith) and H. R. 8505 (Price) May 26; H. R. 8773

(Robison) June 3; arranging for orderly marketing of certain imported articles; to Committee on Ways and Means.

**SALMON:** Rep. Pelly in the House (Congressional Record, June 1, 1965, p. 11636), stated that he had wired President Johnson urging him to intervene personally and seek Japanese cooperation in support of American fishery conservation of north Pacific red salmon.

**SMALL BUSINESS DISASTER ASSISTANCE:** Additional Assistance for Disaster Victims: Hearings before the Subcommittee on Small Business of the Committee on Banking and Currency, House of Representatives, 89th Congress, 1st session, on H. R. 8060 and S. 1796, to amend the Small Business Act to provide additional assistance for disaster victims, May 12, 1965, 16 pp., printed. Contents include statements and letters of various members of Congress. Bills would authorize extension of the length of SBA loans from 20 to 30 years and a moratorium of up to 5 years on the payment of principal and interest on disaster loans; also increase SBA's revolving fund by \$50 million.

Senate Committee on Banking and Currency reported (S. Rept. 177) May 6, 1965, on S. 1796, to amend the Small Business Act to provide additional assistance for disaster victims. Passed Senate May 7, 1965, referred to House for concurrence May 10, 1965; to Committee on Banking and Currency. That Committee reported (H. Rept. 354) to House S. 1796 May 19, 1965.

Introduced in House H. R. 8150 (Culver) May 13, 1965; H. R. 8151 (Curtis) May 13; H. R. 8287 (Hansen of Iowa) May 19; to Committee on Banking and Currency; similar to S. 1796.

House June 7, 1965, passed over without prejudice S. 1796.

**STATE DEPARTMENT APPROPRIATIONS FY 1966:** Departments of State, Justice, Commerce, the Judiciary, and related agencies appropriations for 1966: Hearings before a subcommittee of the Committee on Appropriations, House of Representatives, 89th Congress, 1st session, Department of State, 1088 pp., printed. Included under the State Department are funds for the various International Fisheries Commissions. Request of \$2.3 million for the Commissions in fiscal year 1966 is \$275,000 over the amount appropriated for fiscal year 1965. Fiscal year 1966 request for funds (increase over 1965 in parentheses): International Pacific Halibut Commission \$251,750 (\$64,650); International Pacific Salmon Fisheries Commission \$418,400 (\$48,900); Inter-American Tropical Tuna Commission \$476,450 (\$84,350); International Commission for the Northwest Atlantic Fisheries \$7,500 (\$1,500); International North Pacific Fisheries Commission \$24,800 (0); International Whaling Commission \$1,000 (\$100); Great Lakes Fishery Commission \$1,106,100 (\$75,400); North Pacific Fur Seal Commission \$2,000 (\$100); Expenses for U. S. Commissioners \$12,000 (0). Testimony discusses program and results of each Commission.

H. R. 8639 (Rooney of N. Y.) introduced in House May 27, 1965, bill making appropriations for the Departments of State, Justice, and Commerce, the Judiciary, and related agencies for the fiscal year ending June 30, 1966, and for other purposes. Same day House committee on Appropriations reported (H. Rept. 427) bill to House; referred to Committee of the Whole House on the State of the Union.

House June 1, 1965, passed H. R. 8639, after adopting a corrective amendment. As approved by the House, the bill would appropriate \$2,025,000 for the International Fisheries Commissions, the same amount as the FY 1965 appropriation, but \$275,000 less than the Department's budget request.

**TECHNOLOGICAL LABORATORY LAND IN MARYLAND:** S. 1988 (Tydings and 1 other) introduced in Senate May 18, 1965, to provide for the conveyance of certain real property of the United States to the State of Maryland; to the Committee on Interior and Insular Affairs. Property affected includes site of Bureau of Commercial Fisheries Technological Laboratory, College Park, Md.

**TERRITORIAL SEA AND CONTIGUOUS ZONE CONVENTION:** S. 1954 (Bartlett) introduced in Senate May 12, 1965, to protect coastal fishery and other resources by implementing the Convention on the Territorial Sea and the Contiguous Zone; to Committee on Commerce. Sen. Bartlett in Congressional Record, May 12, 1965 (pp. 9949-9951), inserted a copy of the Geneva Convention on the Territorial Sea and the Contiguous Zone and a list of the 25 nations which have ratified the convention to date. That convention was adopted as one of four conventions at the 1958 Law of the Sea Conference in Geneva. It was ratified by the United States on Apr. 12, 1961, and brought into force on Sept. 10, 1964, by ratification of the Dominican Republic, which represented the 22nd nation to ratify. Since that date, three additional nations have ratified. The Senator pointed out that the bill would implement the Convention by requesting the President to direct that all necessary research be accomplished to indicate on a large-scale official map the baseline for measuring the breadth of the territorial sea as is specifically required by article 3 of the convention, including the employment of straight baselines where appropriate under article 4 of the convention. The Territorial Sea Convention does not mention contiguous zones for fishery regulation, although many nations, including many which have ratified the convention, have established contiguous zones not to exceed 12 miles for purposes of fishery regulation. At the 1958 Geneva Conference on the Law of the Sea, the decision was made to treat fisheries under a separate convention, which to date has not been ratified by the necessary 22 nations. The bill also would express the sense of Congress that in the preparation of the map the United States should adhere to the convention method of employing straight baselines where the coastline is such that it will permit.

**VESSEL "ELVA L.":** S. 1275 (Muskie of Maine and 1 other) introduced in Senate Feb. 24, 1965; to Committee on Commerce. That Committee reported (S. Rept. 189) bill favorably May 14.

S. Rept. 189, Documentation of the Vessel "Elva L." with Full Coastwise Privileges (May 14, 1965, report from the Committee on Commerce, U. S. Senate, 89th Congress, 1st session, to accompany S. 1275), 5 pp., printed. Committee reported bill favorably without amendments. Discusses purpose and reason for the bill, agency comments, and changes in existing law.

S. 1275, authorizing the vessel Elva L. to be documented as a vessel of the U. S. with coastwise privileges, was passed by the Senate without amendment May 17, 1965. The Elva L. is a fishing vessel constructed in Canada in 1948. The owner, a lobsterman and

lobster dealer, uses the 43-foot vessel (under 10 net tons) to transport lobsters and bait owned by him between Rockland and Matinicus, Maine. The vessel was purchased with the belief and understanding that this limited use of a foreign-built vessel was not prohibited by law. The Bureau of Customs has advised the owner otherwise. (Foreign-built vessels by law are ineligible to be documented for domestic coastwise trade or fishing.) Thus the bill permits the vessel, although foreign-built, to operate in the domestic trade.

House May 18, 1965, received for concurrence the Senate-passed S. 1275; to Committee on Merchant Marine and Fisheries.

**VESSEL MEASUREMENT:** Senate, June 1, 1965, received a letter from the Secretary of the Treasury, transmitting a draft of proposed legislation to simplify the admeasurement of small vessels (with accompanying papers); to Committee on Commerce.

**WATER POLLUTION CONTROL ACT:** Special Subcommittee of Senate Committee on Public Works, May 19, 1965, began hearings to receive testimony for the evaluation of progress made under the Federal Water Pollution Control Act. Hearings continued May 20.

**WATER POLLUTION IN U. S. NAVIGABLE WATERS:** Introduced in House H. R. 8421 (Dingell) May 25, 1965; H. R. 8744 (McCarthy) June 3; H. R. 8801 (Ashley) June 7; to expand and improve existing law and to provide for the establishment of regulations for the purpose of controlling pollution from vessels and certain other sources in the Great Lakes and other navigable waters of the United States; to Committee on Merchant Marine and Fisheries.

**WATER PROJECT RECREATION ACT:** By a voice vote the House May 18, 1965, passed H. R. 5269, the Federal Water Project Recreation Act, after adopting a committee substitute amendment that supplied new text. This passage was subsequently vacated and S. 1229, a similar bill, was passed in lieu after being amended to contain the House-passed language.

Rep. Grabowski in Congressional Record, May 19, 1965 (pp. 10567-10568), spoke in House in favor of H. R. 5269. He stated that this legislation will bring much needed consistency to the handling of recreation and fish and wildlife as part of Federal multiple purpose water resource projects.

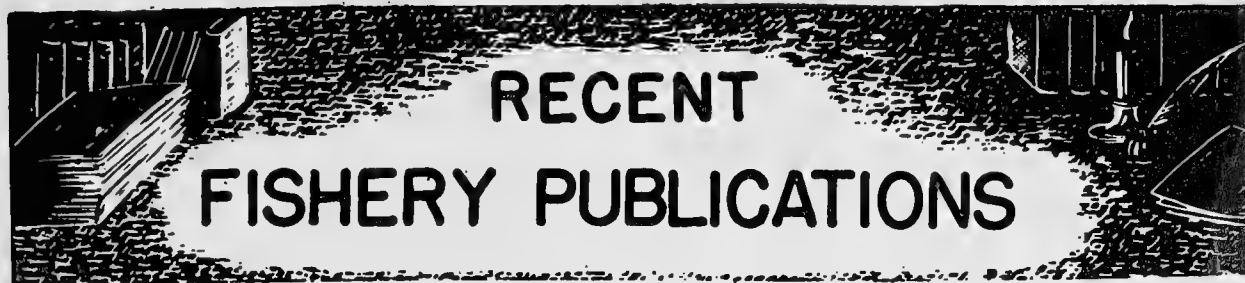
Senate May 20, 1965, disagreed to House amendment to S. 1229, asked for conference with House and appointed conferees.

House May 27, 1965, insisted on its amendment to S. 1229; agreed to a conference requested by the Senate, and appointed conferees.

**WATER RESOURCES RESEARCH:** House May 25, 1965, received a communication from the President of the United States, transmitting a report of the Federal water resources research program for fiscal year 1966; to Committee on Interior and Insular Affairs.

**Note: REPORT ON FISHERY ACTIONS IN 88TH CONGRESS:** The U. S. Bureau of Commercial Fisheries has issued a leaflet on the status of all legislation of interest to commercial fisheries at the end of the 88th Congress. For copies of MNL-3—"Legislative Actions Affecting Commercial Fisheries, 88th Congress, 1st Session 1963 and 2nd Session 1964," write to the Fishery Market News Service, U. S. Bureau of Commercial Fisheries, 1815 N. Fort Myer Drive, Room 510, Arlington, Va. 22209. Requests for this leaflet will be filled on a first-come first-served basis until the supply is exhausted.





## FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON, D. C. 20402. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.  
FL - FISHERY LEAFLETS.  
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.  
SL - STATISTICAL LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.  
SSR. - FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

- | Number   | Title   |
|----------|---|
| CFS-3743 | - Shrimp Landings, November 1964, 5 pp.                     |
| CFS-3744 | - Gulf Coast Shrimp Data, November 1964 (Revised), 21 pp.   |
| CFS-3750 | - Gulf Coast Shrimp Data, December 1964, 19 pp.             |
| CFS-3752 | - Rhode Island Landings, November 1964, 3 pp.               |
| CFS-3755 | - Florida Landings, January 1965, 8 pp.                     |
| CFS-3758 | - Virginia Landings, December 1964, 4 pp.                   |
| CFS-3760 | - Frozen Fishery Products, February 1965, 8 pp.             |
| CFS-3761 | - Massachusetts Landings, August 1964, 9 pp.                |
| CFS-3764 | - Massachusetts Landings, September 1964, 9 pp.             |
| CFS-3765 | - Massachusetts Landings, October 1964, 9 pp.               |
| CFS-3766 | - Michigan, Ohio & Wisconsin Landings, December 1964, 4 pp. |
| CFS-3768 | - New York Landings, January 1965, 4 pp.                    |
| CFS-3769 | - Maryland Landings, January 1965, 3 pp.                    |
| CFS-3770 | - New Jersey Landings, January 1965, 3 pp.                  |
| CFS-3774 | - California Landings, January 1965, 4 pp.                  |
| CFS-3775 | - Massachusetts Landings, November 1964, 9 pp.              |
| CFS-3777 | - Canned Fishery Products, 1964 Annual Summary, 17 pp.      |
| CFS-3778 | - Industrial Fishery Products, 1964 Annual Summary, 9 pp.   |
| CFS-3779 | - Louisiana Landings, January 1965, 3 pp.                   |
| CFS-3781 | - Texas Landings, November 1964, 2 pp.                      |
| CFS-3782 | - Texas Landings, December 1964, 2 pp.                      |
| CFS-3783 | - North Carolina Landings, February 1965, 4 pp.             |
| CFS-3787 | - Maine Landings, January 1965, 4 pp.                       |
| CFS-3792 | - Florida Landings, February 1965, 8 pp.                    |

CFS-3800 - Fisheries of the United States, 1964 (A Preliminary Review), by Charles H. Lyles, 88 pp., illus., April 1965. This report, containing several

features not included in the 1963 version, presents detailed information on the United States catch of fish and shellfish, production of manufactured fishery commodities, foreign trade in aquatic products, and supplies of selected fishery items (domestic production plus imports). Data in the report show that the catch in 1964 amounted to 4,523 million pounds worth \$390 million ex-vessel. Although this was the smallest catch since 1953, it was the second most valuable on record. Of the total, 2,461 million pounds were used for human food, while the remainder was used for the manufacture of industrial products and for bait and animal food. In 1964, for the second consecutive year, over half the U. S. supply of fish was of foreign origin--about 7,509 pounds. Shrimp again was the most valuable item landed by American fishermen (\$70 million), with Pacific salmon running second. Salmon, king crab, oyster, and blue crab production were all higher than in 1963. Production of canned fishery products, also higher than in the previous year, amounted to 1.1 billion pounds worth \$431 million to the packers. Record production of both fish portions and canned tuna was set. Output of fish meal, scrap, oil, and solubles, and agar-agar, buttons from mollusk shells, and other industrial products was worth \$69.6 million (an increase of \$1 million over the value in 1963). New tables include those on additions to the U. S. fleet, supply of scallop meats, supply of canned shrimp, and military purchases. For the first time, landings of tuna in American Samoa are included in the tables on supply of that species.

### Wholesale Dealers in Fishery Products (Revised):

- SL-26 - Illinois (Great Lakes Area), 1963, 2 pp.
- SL-28 - Michigan (Great Lakes Area), 1963, 3 pp.
- SL-29 - Ohio (Great Lakes Area), 1963, 2 pp.
- SL-30 - Pennsylvania (Great Lakes Area), 1963, 1 p.
- SL-31 - New York (Great Lakes Area), 1963, 1 p.
- SL-34 - Wisconsin (Mississippi River and Tributaries), 2 pp.
- SL-35 - Illinois (Mississippi River and Tributaries), 2 pp.
- SL-39 - Tennessee (Mississippi River and Tributaries), 2 pp.
- SL-41 - Arkansas (Mississippi River and Tributaries), 2 pp.
- SL-47 - Louisiana (Mississippi River and Tributaries), 1 p.
- SL-48 - Indiana (Mississippi River and Tributaries), 1 p.
- SL-162 - Firms Producing Fish Sticks and Fish Portions (Revised), 1964, 3 pp.

Sep. No. 736 - The U. S. Cod Fishery in the Northwest Atlantic.



Sep. No. 737 - Some Observations of the Distribution of Penaeid Shrimp in Eastern Venezuela.

FL-41 - List of State Fish Hatcheries and Rearing Stations, 29 pp., revised March 1964.

SSR-Fish, No. 493 - Salmon Escapements above Rock Island Dam, 1954-60, by Robert R. French and Roy J. Wahle, 20 pp., illus., March 1965.

SSR-Fish, No. 500 - Annual Fish Passage Report - Rock Island Dam, Columbia River, Washington, 1963, by Paul D. Zimmer and John H. Broughton, 26 pp., illus., March 1965.

SSR-Fish, No. 501 - The Fishery for Blue Crabs in the St. Johns River, Florida, With Special Reference to Fluctuation in Yield Between 1961 and 1962, by Martin E. Tagatz, 14 pp., illus., Feb. 1965.

Electrofishing Boat with Variable Voltage Pulsator for Lake and Reservoir Studies, by F. Phillip Sharpe, Circular 195, 10 pp., illus., printed, Sept. 1964.

Field Identification of the Northeastern Pacific Rockfish (SEBASTODES), by Charles R. Hitz, Circular 203, 61 pp., illus., March 1965.

The Pacific Northwest Region of the Bureau of Commercial Fisheries, Circular 207, 27 pp., illus., April 1965. Contains information on research and service programs and their recent accomplishments in the Region. Presents short sketches on the work of the biological and technological laboratories; Columbia Fisheries Program Office; and fish-passage, and exploratory fishing and gear research. Also includes accounts of the functions of the marketing, market news and statistics, enforcement, and loans and grants offices. Photos enhance the attractiveness of this circular.

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE ONLY FROM THE ICHTHYOLOGICAL LABORATORY, BUREAU OF COMMERCIAL FISHERIES, U. S. NATIONAL MUSEUM, WASHINGTON, D. C. 20560.

Bathypelagic Fishes of the Antarctic. I--Family Myctophidae, by A. P. Andriashev, Translation No. 29, 100 pp., processed. (Translated from the Russian, Explorations of the Fauna of the Seas, I, 1962, pp. 216-294.)

Development of the Flying Fish CHEILOPOGON (PTEN-ICHTHYS) UNICOLOR (Cuv. et Val.) (Pisces, Exocoetidae), by N. N. Gorbunova and N. V. Parin, Translation No. 32, 8 pp., processed. (Translated from the Russian, Trudy Instituta Okeanologii, vol. 62, 1963, pp. 62-67.)

The Species Composition of the Blenniidae of the Black Sea, by A. N. Svetovidov, Translation No. 31, 16 pp., processed. (Translated from the Russian, Zoologicheskii Zhurnal, Akademiia Nauk SSSR, vol. 37, no. 4, 1958, pp. 584-593.)

On the Species Composition and Distribution of Sculpins of the Genus TRIGLOPS Reinh. in the Northern Seas, by A. P. Andriashev, Translation No. 30, 21 pp., processed. (Translated from the Russian, Akademiia Nauk Trudy Vsesoyuznogo Gidrobiologicheskogo Obshchestva, vol. 1, 1949, pp. 194-209.)

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, March 1965, 13 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif. 90731.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; prices for fish meal, oil, and solubles; for the month indicated.

California Fishery Market News Monthly Summary, Part II - Fishing Information, March 1965, 12 pp., illus. (U. S. Bureau of Commercial Fisheries, Tuna Resources Laboratory, P. O. Box 271, La Jolla, Calif. 92038.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the month indicated.

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, March 1965, 13 pp. (Market News Service, U. S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans, La. 70130.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; Gulf menhaden landings and production of meal, solubles, and oil; fishery imports at Mobile, Ala., Morgan City and New Orleans, La., Miami, Fla., and Houston, Port Isabel, and Brownsville, Tex.; and sponge sales; for the month indicated.

List of Chicago Brokers and Importers of Fishery Products and Byproducts, 1965, 6 pp. (Market News Service, U. S. Fish and Wildlife Service, Rm. 704, 610 S. Canal St., Chicago, Ill. 60607.)

List of Primary Receivers of Imported Fishery Products and Byproducts at New York, 1964, 26 pp., processed, January 4, 1965. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York, N. Y. 10038.)

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, March 1965, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va. 23369.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New England Fisheries--Monthly Summary, February 1965, 22 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston, Mass. 02210.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial-fish landings and ex-



vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, and Provincetown), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the month indicated.

New York City's Wholesale Fishery Trade--Monthly Summary--January and February 1965, 15 and 17 pp. respectively. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York, N. Y. 10038.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the months indicated.

Receipts and Prices of Fresh and Frozen Fishery Products at Chicago, 1964, by C. E. Cope, 66 pp., illus., April 1965. (Fishery Market News Service, Rm. 704, 610 S. Canal St., Chicago, Ill. 60607.) Summarizes fishery products receipts and prices at Chicago during 1964. Notable events were the initiation of import data publication for the Chicago and Detroit Ports of Entry, the formation of The Midwest Federated Fisheries Council, and the opening of 2 Great Lakes fish meal plants. Statistical tables include data on receipts of fish and shellfish at Chicago wholesale market by species, states, and provinces, and by months; wholesale market price ranges by months for fresh-water fish, frozen fillets, and other frozen fish and shellfish; and imports reported by Bureau of Customs at Chicago and Detroit, by species and country, May-Oct. 1964. A stylized drawing with a fish theme, by a professional artist, on the front cover helps make this a handsome and well planned report.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, March 1965, 7 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl vessels reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

THE FOLLOWING SERVICE PUBLICATION IS FOR SALE AND IS AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. 20402.

Fish Recipes from the Great Lakes, Circular 201, 16 pp., illus., printed, 1965, 25 cents. Presents new methods of achieving culinary magic in preparing and cooking fish from the Great Lakes. Bureau of Commercial Fisheries home economists have de-

veloped 24 new recipes and serving ideas for lake and river fish such as yellow perch, catfish, whitefish, pickerel, smelt, buffalofish, and other Great Lakes species. Illustrations are in color. The Great Lakes have been a source of food since America's earliest days. The region's fishery industry reached peak development at the turn of the 20th century and, despite a decline in recent years, provides nearly 100 million pounds of choice fish annually.

## MISCELLANEOUS PUBLICATIONS

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### ALASKA:

A Technical Study of Investment Opportunities in Southeastern Alaska with an Evaluation of the Economic Impact of the "Marine Highway" System, 250 pp., illus., processed, Jan. 1965, \$1.25. Area Redevelopment Administration, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Includes, among other specific short and medium range industrial and commercial opportunities in Southeastern Alaska, a prospectus on a plant for processing for export canned, frozen, and packaged fishery products, employing 20 to 25 skilled, semi-skilled, and unskilled workers.

### AMINO ACIDS:

"The amino acid sequence in fin-whale insulin," by Hiroko Hama and others, article, Journal of Biochemistry, vol. 56, Sept. 1964, pp. 285-293, printed. The Japanese Biochemical Society, c/o Department of Biochemistry, Faculty of Medicine, Tokyo University, Bunkyo-ku, Tokyo, Japan.

"Structure of sperm whale myoglobin. I--Amino acid composition and terminal groups of the chromatographically purified protein," by A. B. Edmondson, article, Chemical Abstracts, vol. 58, June 24, 1963, Abstract No. 14346c, printed, American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

### ANTIBIOTICS:

Antibiotics and the Preservation of Wet Fish, Torry Advisory Note No. 19, 8 pp., printed, Sept. 1964. Torry Research Station, Department of Scientific and Industrial Research, 135 Abbey Rd., Aberdeen, Scotland.

### AUSTRALIA:

Annual Report for 1963/64, 187 pp., printed, 1964. Commonwealth Scientific and Industrial Research Organization, 314 Albert St., East Melbourne C2, Victoria, Australia.

### BASS:

A Bibliography of the Striped Bass or Rockfish, *ROCCUS SAXATILIS* (Walbaum), by Hensley C. Woodbridge and Hunter M. Hancock, 23 pp., printed, 1964, \$1. Sport Fishing Institute, Bond Bldg., Washington, D. C.

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#### BOTULISM:

"Botulinum toxin, type A: effects on central nervous system," by E. H. Polley and others, article, *Science*, vol. 147, no. 3661, Feb. 26, 1965, pp. 1036-1037, illus., printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005.

#### BUTTERFISH:

"Study on the larvae of fishes in the northeastern sea area along the Pacific Coast of Japan. III--Takabe (butter-fish), *Labracoglossa argentiventris* Peters," by Shigeru Odate, article, *Bulletin of the Tohoku Regional Fisheries Research Laboratory*, vol. 21, 1962, pp. 63-70, illus., printed in Japanese with English summary. Tohoku Regional Fisheries Research Laboratory, Shiogama, Miyagi, Japan.

#### CALIFORNIA:

*California Fish and Game*, vol. 51, No. 2, April 1965, 64 pp., illus., printed, single copy 75 cents. Office of Procurement, Documents Section, P. O. Box 1612, Sacramento, Calif. 95807. Includes, among others, articles on: "Survey on the marine environment offshore of San Elijo Lagoon, San Diego County," by Charles H. Turner, Earl E. Ebert, and Robert R. Given; and "Developmental temperature tolerance and rates of four Southern California fishes, *Fundulus parvipinnis*, *Atherinops affinis*, *Leuresthes tenuis*, and *Hypsoblennius* sp.," by Clark Hubbs.

#### CANADA:

*Annual Report for the Fiscal Year Ended March 31, 1964*, 108 pp., printed, 1964. Department of Lands and Forests, Edmonton, Alberta, Canada. Contains a chapter on fish and wildlife.

*Annual Report 1963/64*, 106 pp., printed, 1964. Department of Mines and Natural Resources, Winnipeg, Manitoba, Canada. Contains report on fisheries.

*Annual Report 1963/64*, 34 pp., printed, 1964. Department of Trade and Industry, Halifax, N. S., Canada. Contains chapter on fisheries.

*Annual Report for 1963/64*, 179 pp., printed, 1964. Department of Natural Resources, Regina, Saskatchewan, Canada. Contains report on the Fisheries Branch.

*Annual Report, 1964*, 23 pp., printed, 1964. Prince Rupert Fishermen's Co-operative Association, Prince Rupert, B. C., Canada.

*Fisheries Council of Canada, Annual Review 1965*, 92 pp., illus., printed. Fisheries Council of Canada, Rm. 703, 77 Metcalfe St., Ottawa 4, Canada. Includes, among others, articles on: "North American Fisheries Conference"; "Fisheries of South Africa," by H. V. Dempsey; "Icelandic fishing fleet," by M. Elisson; "F. A. O. and U. N. S. F.," by F. E. Popper; "Atlantic sealing industry," by D. E. Sergeant; "Canada's commercial fisheries," by F. W. Wallace; "Fisheries technology in B. C.," by R. L. Payne; and "Commercial fisheries--1964," by J. N. Lewis.

*Fisheries Statistics of British Columbia, 1964* (Preliminary), 13 pp., processed, April 1965. Canadian Department of Fisheries, 1155 Robson St., Vancouver 5, B. C., Canada.

*Fishes of Northern Ontario, North of the Albany River*, by R. A. Ryder, W. B. Scott, and E. J. Crossman, Contribution No. 60, 30 pp., illus., printed, 1964, C\$0.75. Royal Ontario Museum, University of Toronto, Toronto, Canada.

*Pecheries Commerciales, 1963* (Commercial Fisheries, 1963), 64 pp., illus., printed in French and English. Quebec Bureau of Statistics, Department of Industry and Commerce, Quebec, Canada.

*Review of the Fisheries, 1964*, 9 pp., printed, 1965. Department of Fisheries, St. John's, Newfoundland, Canada.

*Survey of Great Slave Lake Domestic Fishery in 1959 and 1962. 1--1962 Census and Fish Supply in North Arm*, by J. J. Keleher, Manuscript Report Series (Biological) No. 800, 71 pp., printed, 1964. Biological Station, Fisheries Research Board of Canada, London, Ontario, Canada.

#### CARP:

*Zeitschrift für Fischerei und Deren Hilfswissenschaften*, vol. 12, nos. 8, 9, 10, Dec. 1964, 240 pp., illus., printed in German with English abstracts. Neumann Verlag, Dr. Schmincke Allee 19, Radebeul 1, German Democratic Republic. Some of the articles are: "Die schädigung von kupfersulfat, zinksulfat, kaliumcyanid, ammoniak und phenol gegenüber karpfen (*Cyprinus carpio*) vom wasser her und nach peroraler applikation" (The toxic effects of cuprous sulphate, zinc sulphate, potassium cyanide, ammonia, and phenol on carp when absorbed from water and when administered by mouth), by Dietwart Nehring; and "Vergleichende anatomisch-physiologische untersuchungen an wild- und teichkarpfen (*Cyprinus carpio* L.)" (Comparative studies of anatomical-physiological differences in wild and pond carp), by Werner Steffens.

#### CEYLON:

*Draft 10-Year Plan for the Development of the Fishing Industry*, 117 pp., printed, 1965. Ceylon Fisheries Corporation, Galle Face, Colombo 3, Ceylon. Since its establishment on Oct. 1, 1964, the Board of Directors of the Ceylon Fisheries Corp. has drawn up a long-term plan for the development of the country's fisheries. Government policy was expressed in a speech by the Governor General of Ceylon on April 9 of this year: "A programme will be implemented (which) will include the building up of a scheme for deep sea fisheries on a modern scale with groups of related fisheries activities so that the country will be in a position to supply all its local requirements of fish and fish products. These measures will ameliorate the conditions of those engaged in the fishing industry, and it is the intention of My Government to provide housing and other facilities for them." This report contains plans for: the production of fishery products--vessels, harbors, and increased landings; domestic consumption and export of fish and shellfish; investment (Government, corporation, and private) in the industry; better incomes and employment of fishermen; and financing of the development projects

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by use of Government revenue and a minimum reliance on credit. Included are many statistical tables showing projected data for 1965-1975.

#### CHESAPEAKE BAY:

Chesapeake Science, vol. 6, no. 1, March 1965, 72 pp., illus., printed, single copy 75 cents. Chesapeake Biological Laboratory, Natural Resources Institute, University of Maryland, Solomons, Md. Some of the articles are: "Relationships between *Bucephalus* sp. and *Crassostrea virginica*: histopathology and sites of infection," by Thomas C. Cheng and Richard W. Burton; "Seasonal setting patterns of five species of bivalves in the Tred Avon River, Maryland," by William N. Shaw; "Supplemental feeding of oysters with starch," by Dexter S. Haven; and "Infection experiment in nature with *Dermocystidium marinum* in Chesapeake Bay," by J. D. Andrews.

#### CHILLING:

Handling and Chilling of Fresh Fish on Board, by Eizaburo Noguchi, Fishery Research Series 7, 35 pp., printed in Japanese, Feb. 1965. Japan Fisheries Resource Conservation Association, 6th Fl., Zenkoku Choson Kaikan Bldg., 1-17, Nagata-cho, Chiyoda-ku, Tokyo, Japan.

#### COELACANTH:

"Coelacanth displayed for first time in U. S.," article, Science Newsletter, vol. 87, no. 13, March 27, 1965, p. 199, illus., printed, single copy 15 cents. Science Service, 1719 N St. NW., Washington, D. C. 20036.

#### CONSUMER PREFERENCE:

"Why consumers purchase frozen fillets, sticks, portions," article, Quick Frozen Foods, vol. 27, Oct. 1964, pp. 80-83, printed. E. W. Williams Publications, Inc., 82 Wall St., New York, N. Y. 10005.

#### CONVERSION FACTORS:

Measures, Stowage Rates and Yields of Fishery Products, by J. J. Waterman, Torry Advisory Note No. 17, 12 pp., illus., printed, Aug. 1964. Torry Research Station, Department of Scientific and Industrial Research, 135 Abbey Rd., Aberdeen, Scotland.

#### CRAB MEAT:

"The browning of canned crab meat. III--The browning of canned crab as dependent upon the time of leaving the raw crab without carapace but uncanned," by Yoshio Hagasawa, article, Chemical Abstracts, vol. 58, April 29, 1963, Abstract No. 9558c, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

#### CUBA:

Translations on Cuba, No. 221 (Cuban Fisheries), JPRS 28082, 77 pp., illus., printed, Dec. 31, 1964, \$3. (Translated from the Spanish, Las Pesquerías Cubanas, no. 20, Feb. 1964.) Clearinghouse, U. S. Department of Commerce, Springfield, Va. 22151.

#### DENMARK:

Beretning for 1964 (Annual Report to the Danish Fishing Industry with an English Translation of the Main Experimental Results), 40 pp., illus., printed in Danish with English summary, Feb. 1965. Fiskeriministeriets Forsøgslaboratorium, Copenhagen, Denmark. Studies include research on fresh fish--

rigor mortis of trout, electric freshness tester, iced herring, and vacuum-packed chilled fish; frozen fish--thawing of block-frozen fish, filleting of thawed raw fish, and peeling of frozen whole shrimp; semipreserved canned fish--spiced herring; sterile canned fish--effect of can lacquers on corrosion, mackerel in tomato sauce, addition of citric acid to canned shrimp; fish meal and oil--removal of odor and flavor from fish meal, composition of fat in fish meal, and fish oil in sow fodder; and separation of fish silage fractions.

#### DOLPHIN:

Experience in Commercial Fishing for Dolphin, USSR, by A. I. Petrenko, TT 64-51963, 14 pp., illus., printed, Dec. 17, 1964, \$1. (Translated from the Russian, Rybnoe Khoziaistvo, no. 3, 1962.) Clearinghouse, U. S. Department of Commerce, Springfield, Va. 22151.

#### ECUADOR:

Apuntes e Informaciones sobre las Pesquerías en la Provincia de Esmeraldas (Notes and Information on the Fisheries in the Province of Esmeraldas), Boletín Informativo, vol. 1, no. 6, 1964, 37 pp., illus., printed in Spanish, single copy \$1.80 (US\$1). Instituto Nacional de Pesca del Ecuador (Biblioteca), Casilla 5918, Guayaquil, Ecuador.

#### ESTUARIES:

"Estuaries--life-lines to the sea," by Will T. Johns, article, The Maryland Conservationist, vol. 42, no. 1, Jan.-Feb. 1965, pp. 2-5, illus., printed, single copy 25 cents. Maryland Game and Inland Fish Commission, State Office Bldg., P. O. Box 231, Annapolis, Md.

#### FAROE ISLANDS:

"The economic development in the Faroes in 1964," 4 pp., article, Faroes in Figures, no. 29, Mar. 1965, pp. 2-3, 6-7, printed. Føroya Fiskasøla, Torshavn, Faroe Islands.

#### FILLETS:

A Report to the Fishing Industry on the Identification of Fresh and Frozen Fillets of Cod, Haddock and Other Species, by P. H. Odense, C. W. Shinnars, and T. C. Leung, New Series Circular No. 20, 2 pp., printed, March 29, 1965. Technological Station, Fisheries Research Board of Canada, Halifax, N. S., Canada. It is sometimes desirable to determine the species of a fresh or frozen fillet, according to this leaflet. Some fillets, for instance cod and haddock, are very similar in appearance and it is difficult to distinguish between them by visual observation alone. However, these and other fillets readily can be identified by the characteristic patterns formed when their proteins are subjected to a procedure known as starch gel electrophoresis. The principles and details of that procedure are described.

#### FINLAND:

"Jaameri--miesten meri" (Arctic seas--fishermen's seas), by Reino Eloranta, article, Suomen Kalastuslehti, no. 5, 1964, pp. 127-130, illus., printed in Finnish. Suomen Kalastusyhdistyksen, Fabianinkatu 5 A 7, Helsinki, Finland.

"Läckra skaldjur" (Delicious shellfish), article, Fiskeritidskrift för Finland, vol. 8, no. 3-4, 1964, pp. 80-

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84, illus., printed in Swedish. Fiskeriforeningen i Finland, Fabiansgatan 5 A 7, Helsinki, Finland.

#### FISH:

Boy's Book of Fishes, by Edward C. Migdalski, 172 pp., illus., printed, 1964, \$5. Ronald Press, 15 E. 26 St., New York, N. Y. 10010. Discusses natural history and biology of common fish species in bodies of waters in and around the United States. For grades 6 to 8.

#### FISH BEHAVIOR:

Biological Problems in Acoustic Systems (Behaviour of Fishes with Special Reference to their Sensory Capacities), Final Report to Office of Naval Research, 12 pp., printed, 1964. University of Maryland, College Park, Md.

"K izucheniyyu prichin sutochnykh vertikal'nykh migratsii ryb" (Causes of daily vertical fish migration), by S. G. Zusser, article, Trudy Soveshchaniya Ikhtologicheskaya Komissiya Akademii Nauk SSSR, vol. 8, 1958, pp. 115-120, printed in Russian. Ikhtologicheskaya Komissiya, Izdatel'stvo Akademii Nauk SSSR, Podmoskenskii per. d. 21, Moscow B-64, U.S.S.R.

#### FISHING WITH LIGHTS:

Purse Seining with Lights from a Motor Dory, by V. M. Kirrilov, Translations (New Series) No. 41, 7 pp., printed, 1964. (Translated from the Russian, Rybnoe Khozaiastvo, no. 1, 1961, pp. 27-31.) Fisheries Laboratory, Ministry of Agriculture, Fisheries and Food, Lowestoft, Suffolk, England.

"Studies on the fluorescent color-lamp for attracting of fish. II--Underwater distribution of color light density and the fish schools aggregated," by Toshiro Kuroki, Hiroshi Nakayama, and Kiyohisa Ueno, article, Bulletin of the Faculty of Fisheries, Hokkaido University, vol. 14, no. 4, 1964, pp. 215-235, printed, Faculty of Fisheries, Hokkaido University, Kameda-Machi, Hakodate, Japan.

#### FISH MEAL:

"Investigations on the loss of nutritive value occurring during storage of raw material for fish meal," by H. J. Papenfuss, Fischereiforschung, vol. 5, 1962, pp. 38-41, printed in German. Institut für Hochseefischerei und Fischverarbeitung, Rostock-Marienehe, German Democratic Republic.

"Protein quality of feeding-stuffs. 2--The comparative assessment of protein quality in three fish meals by microbiological and other laboratory tests, and by biological evaluation with chicks and rats," by J. Bunyan and A. A. Woodham; "3--Comparative assessment of the protein quality of three fish meals given to growing pigs," by R. S. Barber and others, articles, British Journal of Nutrition, vol. 18, no. 4, 1964, pp. 537-554, printed, Cambridge University Press, 32 E. 57th St., New York, N. Y. 10022.

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Substances Responsible for Taste and Smell in Fish, by F. Bramstedt, FRB Translation Series No. 235, 14 pp., printed. (Translated from the German, Archiv für Fischereiwissenschaft, vol. 8, pp. 94-103.) Fisheries Research Board of Canada, Sir Charles Tupper Bldg., Riverside Dr., Ottawa, Canada.

#### FLOUNDER:

"Lipids of flounder. II--Conjugated lipids from flounder flesh, Hippoglossoides dubius," by Hisanao Igarashi and others, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 29, Sept. 1963, pp. 865-869, printed. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-Kai-gandori 6, Minato-ku, Tokyo, Japan.

#### FOOD AND AGRICULTURE ORGANIZATION:

Council, Food and Agriculture Organization of the United Nations, Forty-Fourth Session, Rome, 21 June 1965--Committee on Fisheries, CL 44/11, 14 pp., processed, Feb. 25, 1965. Council of the Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy. This paper presents proposals for the establishment of a permanent Committee on Fisheries for consideration by the Council of the FAO at its meeting on June 21, 1965. It discusses functions of the Committee, FAO Constitutional bases for the Committee, and recommendations for alternate procedures to be followed in its establishment by the Conference. Included are a list of relevant documents, a new Rule dealing with the Committee on Fisheries, and an international convention on cooperation in fisheries; the last two for possible adoption by the FAO.

#### FOREIGN TRADE ZONES:

Small Business Opportunities in Foreign Trade Zones and International Business, by William A. Dymnsa, Management Research Summary, 4 pp., processed, 1964. Small Business Administration, Washington, D. C. 20416.

#### FRANCE:

Bulletin d'Information, no. 18, March 1965, 38 pp., illus., processed in French. Comité Locales Pêches Maritimes de Bayonne, Bayonne, France. Contains, among others, these articles: "La pêche en 1964 dans le quartier de Bayonne" (The fishery in 1964 in the Bayonne area); "Bilan de l'exercice 1964 du plan de relance" (Balance sheet for the fiscal year for the rehabilitation plan); "Thermocline et pêche du thon au large de la Côte Occidentale d'Afrique" (Thermocline and the tuna fishery off the west coast of Africa); "Les campagnes de la sardine et de l'anchois" (The sardine and anchovy seasons); and "La campagne thonière Africaine" (The African tuna season).

"Cultiver la mer, pour accroître la production de la pêche" (Cultivating the sea to increase fishery production), by J. E. Shelbourne, article, La Pêche Maritime, vol. 44, no. 1044, March 1965, pp. 161-162, illus., printed in French, single copy 14 F (about US\$2.85). Les Éditions Maritimes, 190, Blvd. Haussmann, Paris 8e, France.

#### FREEZE-DRYING:

How Freeze-Drying Works, by Kermit Bird, 10 pp., processed, 1965. Marketing Economics Division, Economic Research Service, U. S. Department of Agriculture, Washington, D. C. 20250.

#### FREEZING:

"Freezing of fish in vertical plate freezers," by J. H. Merritt and J. Templeton, article, Modern Refrigeration, vol. 67, no. 796, July 1964, pp. 706-712, illus., printed. Refrigeration Press Ltd., McLaren House, 131 Great Suffolk St., London SE1, England.

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## FROZEN FISH:

"Are IQF fish fillets the next major trend?" article, Quick Frozen Foods, vol. 27, Oct. 1964, pp. 235-236, printed, E. W. Williams Publications, Inc., 82 Wall St., New York, N. Y. 10005.

"Influence of freezing rate on fish quality," by D. G. Rutov, article, Kholodil'naya Tekhnika, no. 1, 1965, p. 67, printed in Russian, single copy 60 kop. (about 70 U. S. cents). Four Continent Book Corp., 822 Broadway, New York, N. Y. 10003.

## GEAR:

Handbook on Fishery Gear, Net Material, and Fishing Equipment, by N. N. Andreev, 504 pp., printed in Russian, 1962. Pishchepromizdat, Moscow, U.S.S.R.

## GENERAL:

The Bountiful Sea, by Seabrook Hull, 352 pp., illus., printed, 1964, \$6.95. Prentice-Hall, Inc., Englewood Cliffs, N. J. 07632. The sea through the centuries has always been a mysterious world, but as man turns more and more to the sea many of its mysteries are being solved with knowledge. The author in his introduction very ably points out that the book "... is a history of man and the seas since before the days of Aristotle. It is a primer on oceanography, demonstrating the vastness and complexity of this realm and its control over the world of land and air in which we live. If it has one fundamental purpose it is to present an overall picture of the total effort and the inextricable interrelationship of science and technology with all of the many things we would do in the sea. In turn, it seeks to relate these things to people--individuals who, in the final analysis, must accept or reject the challenge." In the first three chapters (the "Earth's Last Great Frontier," "From the Beginning, The Sea," and "Out of the Darkness, Into the Depths") the author discusses man's relationship to the sea and his quest for knowledge about the mysterious world of the sea throughout history. The balance of the book deals with the future of the sea; its riches; living, working, and playing beneath the sea; what we can learn from the creatures of the sea; and what is needed to garner the bounty of the sea. The various chapters delve into the pulses of the sea, the living sea and its challenge, the war of sound and darkness, mobilization of forces to exploit its riches, the profit and adventure to be found in the sea, and what the bountiful sea can provide. The last chapter deals with "Men of Conquest." In discussing the mobilization of forces, the author describes the sea as "a cornucopia of raw materials for man's industries, food for his stomach, health for his body, challenges to his mind, and inspiration to his soul." In essence the author points out that the food that will be needed to feed the exploding world population is to be found in the sea. Looking into the crystal ball, he foretells the day when nets and hooks in harvesting the sea will give way to bubble screens and electrical fields to lure or herd just the desirable size and species of fish into great suction hoses or right up through an underwater hatch into the holds of fishing vessels. But he does warn that man must practice conservation if he is to preserve the bounty of the sea for future generations. The sea as a new source of fresh water and the world's greatest known reserve of raw materials (such as diamonds, gold, coal, iron ore, tin,

sulphur, oil etc.) is vividly explained. Illustrated with some excellent black and white photographs, the book also contains references and suggestions for further reading and a good index. Most of the book is written in such a way that it is easy reading. Businessman, scientist, scholar, researcher, sport or commercial fisherman, and anyone who has any interest at all in the sea will find the book fascinating reading and a treasure house of facts about the sea.

-J. Fileggi

The First Book of Fishes, by Jeanne Bendick, 72 pp., illus., printed, \$2.65, 1965. Watts, Franklin, Inc. 699 Madison Ave., New York, N. Y. 10021. Tells children about a variety of fish.

## GERMAN FEDERAL REPUBLIC:

Market Factors in the Federal Republic of Germany, by Melissa F. Wells and Margot W. Zener, OBR 65-16, 8 pp., printed, March 1965, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

## HALIBUT:

Pacific Halibut Fishery Regulations (Effective March 23, 1965), 13 pp., illus., printed, International Pacific Halibut Commission, Fisheries Hall No. 2, University of Washington, Seattle, Wash. 98105.

## HERBICIDES:

"Evaluation of herbicides for control of aquatic weeds," by R. D. Blackburn and L. W. Weldon, article, Annual Report of the Florida Agricultural Experiment Stations, pp. 257-267, printed, 1962. Agricultural Experiment Station, University of Florida, Gainesville, Fla.

## HERRING:

"A contribution to the classification of Clupeoid fishes," by P. J. P. Whitehead, article, Annals and Magazine of Natural History, vol. 5, no. 60, 1962, pp. 737-750, printed. Taylor and Francis Ltd., Red Lion Court, Fleet St., London EC4, England.

Distribution of Herring of the Atlanto-Scandinavian Stock, by J. G. Friedland, I. I. Osetinskaia, and T. A. Bernikova, Translations (New Series) No. 53, 8 pp., illus., processed, 1964. (Translated from the Russian, Soviet Fisheries Investigations in Northern European Seas, Moscow, 1960, pp. 379-389.) Fisheries Laboratory, Ministry of Agriculture, Fisheries and Food, Lowestoft, Suffolk, England.

"Silakkatutkimukset II" (Herring study II), by Veikko Sjöblom, article, Suomen Kalastuslehti, no. 10, 1964, pp. 257-268, illus., printed in Finnish. Suomen Kalastusyhdistyksen, Fabianinkatu 5 A 7, Helsinki, Finland.

"Strömmingsundersökningarna" (Investigations of the Baltic herring), by Veikko Sjöblom, article, Fiskeritidskrift för Finland, vol. 8, no. 5-6, 1964, pp. 113-129, illus., printed in Swedish. Fiskeriföreningen i Finland, Fabiansgatan 5 A 7, Helsinki, Finland.

## ICHTHYOLOGY:

An Examination of Certain Aspects of the Methodology and Theory of Fisheries Biology, by G. L. Kesteven,

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vol. 137-B, 21 pp., printed, 1964. Council for Scientific and Industrial Research, Division of Fisheries, Cronulla, N. S. W., Australia.

#### IMPORTS:

U. S. Imports of Merchandise for Consumption (SITC Group Totals: 1 Digit, 2 Digit, 3 Digit; Commodity by Country, Area by Commodity, Country by Commodity), December 1964, FT 125, 490 pp., processed, April 1965, single copy \$1.50. Bureau of the Census, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) The statistical tables include imports of fish, shellfish, and processed fishery products, country by commodity and commodity by country for December 1964 and totals for 1964.

#### INTERNATIONAL AGREEMENTS:

Fisheries, King Crab, Agreement between United States and Japan, Effected by Exchange of Notes Signed Washington Nov. 25, 1964 (Entered into Force Nov. 25, 1964), Treaties and Other International Acts Series, No. 5688, 7 pp., printed, 1964, 5 cents. Department of State, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

#### ITALY:

Annuario Statistico della Pesca e della Caccia, 1963 (Statistics Annual for Fishing and Hunting, 1963), vol. 11, 1963, 169 pp., illus., printed in Italian, 1964. Istituto Centrale di Statistica, Repubblica Italiana, Rome, Italy. Contains 1962 data with comparisons on fishery landings; and receipts, sales, and average prices of fishery products at principal markets. Also contains hunting data.

Bolletino di Pesca, Piscicoltura e Idrobiologia, vol. 18, no. 2, July-Dec. 1963, 149 pp., illus., printed in Italian with French and English summaries, single copy L. 1,200 (about US\$1.90). Laboratorio Centrale di Idrobiologia, Piazza Borghese, 91, Rome, Italy. Among the articles are: "Studi sulla biologia e pesca di *Xiphias gladius* (Nota II)" (Studies on the biology and fishery of *Xiphias gladius*--swordfish), by Cavaliere Antonino; and "L'osticoltura nello Stagno di Thau" (Oyster culture in Thau Pond), by Matta Francesco.

#### JAMAICA:

Foreign Trade Regulations of Jamaica, by Walter Haidar, OBR 65-15, 8 pp., printed, March 1965, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

#### JAPAN:

Bulletin of the Faculty of Fisheries, Nagasaki University, no. 18, Feb. 1965, 136 pp., illus., printed in Japanese with English summaries. The Faculty of Fisheries, Nagasaki University, Nagasaki, Japan. Some of the articles are: "On some shrimps from the Philippine Sea" (in English), by Y. Yokoya and K. Shibata; "Studies on the little toothed whales in the west sea area of Kyushu. XII--Neomeris phocaenoides, so-called Japanese 'sunameri,' caught in the coast of Tachibana Bay, Nagasaki Pref.," by K. Mizue, K. Yoshida, and Y. Masaki; "Studies on

*Penaeus orientalis* Kishinouye. II--Morphological classification of the ovarian eggs and the maturity of the ovary," by M. Oka and S. Shirahata; and "Studies on the metabolism of oxalic acid in fish muscle. I--Seasonal variations and influence of temperature on oxalic acid content in fish muscle," by M. Yasuda, Y. Yamazoe, and T. Ishihara.

Foreign Trade Regulations of Japan, by Lois J. DeNauw, OBR 65-11, 12 pp., printed, March 1965, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

Hokusuishi Geppo (Monthly Report of the Hokkaido Fisheries Research Laboratory), vol. 22, no. 2, Feb. 1965, 58 pp., illus., printed in Japanese, single copy 100 yen (about 28 U. S. cents). Hokkaido Central Fisheries Research Laboratory, 238-banchi, Hamanaka-cho, Yoichi, Hokkaido, Japan. Includes articles on "Life of the dab of Ishikari Bay and the resource," by Y. Kaga and K. Sugama; "Fishes in the nearby seas of Hokkaido--the flatfishes," by T. Ueno; "Improving the bleaching process of frozen ground fish--on the possibility of economizing on water," by T. Fukumi and others; "Mold stains on fishery products and their prevention," by T. Sato and Y. Okuda.

Laws and Regulations Relating to Organizations of the Ministry of Agriculture and Forestry, 178 pp., printed in Japanese, Aug. 31, 1964. Documents Section, Secretariat, Ministry of Agriculture and Forestry, 2-1, Kasumigaseki, Chiyoda-ku, Tokyo, Japan.

Long-Range View of Coastal Fishery Production and Regional Characteristics, Research Data 63-8, 53 pp., printed in Japanese, May 1964. Research and Legislative Reference Bureau, National Diet Library, Tokyo, Japan.

"Le nouvel entrepôt frigorifique de Kanagawa au Japon permet le stockage de 5000 tonnes de thons" (The new cold-storage warehouse at Kanagawa, Japan, enables the storage of 5,000 metric tons of tuna), article, *La Pêche Maritime*, vol. 44, no. 1044, March 1965, pp. 179-180, illus., printed in French, single copy 14 F (about US\$2.85). Les Éditions Maritimes, 190, Blvd. Haussmann, Paris 8e, France.

Report on Investigations on Young Fish and Fry as Basic Data for Improvement of Coastal Fishery Management, 266 pp., printed in Japanese, Nov. 1964. Investigation and Research Division, Fisheries Agency, Ministry of Agriculture and Forestry, 2-1, Kasumigaseki, Chiyoda-ku, Tokyo, Japan.

Available from the Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba Kai-gandori 6, Minato-ku, Tokyo, Japan. Printed in Japanese with English abstracts.

Bulletin of the Japanese Society of Scientific Fisheries, vol. 30, no. 10, Oct. 1964, 82 pp., illus. Contains, among others, articles on: "Studies on the bait in trolling. I--On the fishing effect of ground bait for bonito trolling," by Shozzyuro Okabayashi; "Studies on the propagation of an abalone, *Haliotis diversicolor supertexta* Lischke. II--On the development," by Toshio Oba; "On the decline in the catch per unit of



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fishing effort and the diminution of average body length due to the exploitation of a virgin stock," by Tasae Kawakami and Takeru Kitahara; "On the oil of fish meal. I--Oxidation of oil in manufacturing of brown fish meal and the effect of antioxidant application thereon," by Kenzo Toyama and others; "On a new amino acid, S-hydroxymethyl-L-Homocysteine isolated from *Chondrus ocellatus*," by Mitsuzo Takagi and Ayako Okumura; "Studies on the retention of meat color of frozen tuna. I--Absorption spectra of the aqueous extract of frozen tuna meat undergoing discoloration," by Masamichi Bito; and "Mechanics of towed nets," by Tasae Kawakami.

\_\_\_\_\_, vol. 30, no. 11, Nov. 1964, 81 pp., illus. Includes, among others, these articles: "On the relationship between activity of Japanese spiny lobster and under water light intensity," by Itsuo Kubo and Naonori Ishiwata; "Studies on the bait in trolling. II--On the death of live bait and missing from hook in tuna long-line fishery," by Syozzyuro Okabayashi; "Free amino acids in the muscle of a few species of fish," by Shoji Konosu, Muzaffer Ozay, and Yoshiro Hashimoto; and "Vitamins in 'katsuwobushi' (dried skipjack)," by Masaaki Yanase, Yasuyuki Shimizu, and Hideo Higashi.

\_\_\_\_\_, vol. 30, no. 12, Dec. 1964, 116 pp., illus. Includes, among others, articles on: "Experimental use of fish pumps. V--Transference of living fish and autopsy of pumped fish," by Chosei Yoshimuta and others; "A study on the growth and age of the jack mackerel in the East China Sea" and "Studies on the resources of the jack mackerel, *Trachurus japonicus* (Temminck et Schlegel) in the East China Sea. I--Survival rate," by Fumio Mitani and Etsuko Ida; "Studies on muscle of aquatic animals. XXXXIII--Creatine and Creatinine contents in fish muscle extracts," by Morihiko Sakaguchi, Masao Hujita, and Wataru Simidu; "\_\_\_\_\_, XXXXIV--Amino acid, trimethylamine Oxide, creatine, creatinine and nucleotides in fish muscle extracts," by Morihiko Sakaguchi and Wataru Simidu; "Bacterial studies on the spoilage of fish sausage. I--Causative bacteria of spot-forming deterioration; II--Causative bacteria of type of gas-forming deterioration," by Motonobu Yokoseki and Yoko Okawa; "Studies on protein denaturation of frozen fish. Comparison between super rapid freezing by liquid nitrogen (-196°C) and air (-20°C) freezing," by Taneko Suzuki, Koichi Kanna and Takeo Tanaka; and "Studies on collagen in aquatic animals. I--On the purification of collagen by enzymatic treatment," by Minoru Kubota and Hideo Tajima.

Articles from *Bulletin of the Tohoku Regional Fisheries Research Laboratory*, vol. 21, 1962, printed in Japanese with English summaries. Tohoku Regional Fisheries Research Laboratory, Shioyama, Miyagi, Japan.

"Fluctuations in the abundance of saury on the northeastern sea area in Japan. I," by Hideyuki Hotta, pp. 1-20, illus.

"On the relation between the pattern of the Kuroshio Current in spring and summer and the saury fishing conditions in fall," by Shin-Ichi Fukushima, pp. 21-37, illus.

#### KENYA:

Preliminary Survey of Bottom Fishing on the North Kenya Banks, by J. F. C. Morgans, *Fishery Publications No. 21*, 98 pp., illus., processed, 1964, 30s. 8d. (\$6 when ordered in the United States). British Colonial Office, London, England. (For sale by British Information Services, 845 Third Ave., New York, N. Y. 10022.) Contains an account of findings made by 3 research vessels on 15 cruises to the North Kenya Banks, 1954-59. Those findings are presented in sections on: charting--topography of the bank system, cartographic techniques, and other topics; weather, sea, and ship's drift; fishing--gear, effort, catch; and biology--breeding, feeding, parasites. Lists are given of the species caught, their average weights, and the sizes at which sexual maturity is reached. The Banks are a unique expansion of the continental shelf off tropical East Africa, according to the author. The most important fish found above the main thermocline were snappers, rock cod, and scavengers (Lethrinidae). There was some evidence that most species exist in loose schools that tend to coalesce as individuals approach sexual ripeness.

#### KOREA:

"Government financial assistance schemes," by Ro, Jai Dong, article; *IPFC Current Affairs Bulletin*, no. 39, April 1964, pp. 1-5, printed. Indo-Pacific Fisheries Council, Food and Agriculture Organization of the United Nations, Maliwan Mansion, Phra Atit Rd., Bangkok, Thailand. Outlines current Republic of Korea governmental action and plans to finance the fisheries industry by a system of loans, subsidies, and grants. Grants of up to 80 percent of costs may be made to individuals or cooperatives for establishing ice-making, freezing, cold-storage, and consignment-sale facilities; for breakwaters or piers recognized as a public need; and for deep-sea fishing vessels, processing plants, and other facilities. The mutual relief insurance system is also described and results of its operation to date are tabulated.

#### LOBSTERS:

"Lobsters to test new trap this winter," article, *Canadian Fisherman*, vol. 51, Jan. 1964, pp. 19, 26, printed. National Business Publications Ltd., Gardenvale, Quebec, Canada.

#### MACKEREL:

"Study on the larvae of fishes in the northeastern sea area along the Pacific Coast of Japan. II--Carangidae: jack-mackerel, scads and yellow-tails," by Shigeru Odate, article, *Bulletin of the Tohoku Regional Fisheries Research Laboratory*, vol. 20, 1962, pp. 94-105, illus., printed in Japanese with English summary. Tohoku Regional Fisheries Research Laboratory, Shioyama, Miyagi, Japan.

#### MALAYSIA:

Malayan Fishing Methods, by T. W. Burdon and M. L. Perry, Monograph on Malay Subjects No. 2, 174 pp., illus., printed, 1954. Malayan Branch, Royal Asiatic Society, Singapore, Malaysia.

#### MARINE ALGAE:

Reserves of Marine Algae and Their Exploitation, 96 pp., printed, 1964. Vsesoyuznoe Gidrobiologicheskoe Obshchestvo, Akademiia Nauk SSSR, Moscow, U.S.S.R.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

#### MARINE MAMMALS:

Determination of the Age of Commercial Pinnipeds and the Efficient Use of Marine Mammals, 57 pp., printed in Russian, 1964. Institut Morfologii Zhivotnykh, Akademiia Nauk SSSR, Moscow, U.S.S.R.

Articles from Vsesoyuznoe Soveshchanie po Izucheniyu Morskikh Mlekopitayushchikh, 1963 (Second All-Union Conference for the Study of Marine Mammals, 1963), printed in Russian. Akademiia Nauk SSSR, Moscow, U.S.S.R.:

"O vyработке edinoi metodiki izucheniya morskikh mlekopitayushchikh" (Developing a unified method for the study of marine mammals), by S. E. Kleineberg, V. M. Bel'kovich, and A. V. Yablokov, pp. 20-21.

"Zadachi regulirovaniya promysla morskikh mlekopitayushchikh v vokakh SSSR" (The tasks of the regulation of hunting of marine mammals in the waters of the U.S.S.R.), by A. D. Druzhinin, Yu. A. Vavilov, and M. L. Kashintsev, pp. 12-13.

#### MEXICO:

"Mexico: inaugura el Puerto Pesquero de Alvarado" (Mexico inaugurates the Fishery Port of Alvarado), article, Industrias Pesqueras, vol. 39, no. 907, Feb. 1, 1965, pp. 51-52, illus., printed in Spanish, single copy 40 ptas. (about US\$0.70). Industrias Pesqueras, Policarpo Sanz, 21-2<sup>o</sup>, Vigo, Spain.

Presencia de la Comision Nacional Consultiva de Pesca (Work of the National Consultative Commission on Fisheries), by Fernando Castro y Castro, Documentos C. P. 3, 14 pp., printed in Spanish, Jan. 1964. Correo Privado, Ave. Juarez No. 30-103, Apartado Postal 6-685, Mexico, D. F., Mexico.

Puerto Pesquero Piloto de Alvarado (Pilot Fishery Port of Alvarado), 32 pp., illus., printed in Spanish. Banco Nacional de Fomento Cooperativo, S. A. de C. V., Mexico, D. F. Describes the new pilot fishery port of Alvarado, on Mexico's Gulf Coast. Discusses development of the Mexican fisheries, the decision to construct a fishery port on the Gulf of Mexico and selection of the site, fiscal and technical details of the project, operation of the port and associated processing plants, and its long-range objectives. Color photos show an aerial view of the port, a shot of fishing vessels at dockside, and scenes in the receiving room, freezing and packing sections, fish meal plant, and other sections.

Reports available from Comision Nacional Consultiva de Pesca, Mexico, D. F., Mexico.:

El Mercado de Productos Pesqueros en Mexico (The Market for Fishery Products in Mexico), by Jesus Perez Urunuela, 138 pp., illus., printed in Spanish, 1964.

Programa Integral para el Desarrollo de la Industria Pesquera en Mexico (Integral Program for the Development of the Fisheries Industry in Mexico), No. 1, 34 pp., printed, 1962.

#### MIDDLE ATLANTIC:

Scientific Fishery Investigations in the Middle Atlantic Region, by A. N. Probatov, E. S. Prosvirov, and

O. G. Riabikov, Translations (New Series) No. 52, 10 pp., illus., processed, 1964. (Translated from the Russian, Soviet Fisheries Investigations in North European Seas, Moscow, 1960, pp. 405-412.) Fisheries Laboratory, Ministry of Agriculture, Fisheries and Food, Lowestoft, Suffolk, England.

#### MOLLUSKS:

"Experiments in mollusc husbandry," by A. D. Ansell, article, Fishing News International, vol. 3, July-Sept. 1964, pp. 216, 218-219, printed. Arthur J. Heighway Publications, Ltd., Ludgate House, 110 Fleet St., London EC4, England.

Mollusks--Problems of Theoretical and Applied Malacology (Conference for the Study of Mollusks), Collected Articles, 344 pp., printed in Russian, 1963. Zoologicheskii Institut, Akademiia Nauk SSSR, Moscow, U.S.S.R.

#### MOROCCO:

Establishing a Business in Morocco, OBR 65-17, 12 pp., printed, March 1965, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

#### MUSSELS:

Aspects of Reproduction, Settling and Growth in the Mussel MYTILUS EDULIS PLANULATUS Lamarck, by B. Wisely, 6 pp., illus., printed, Dec. 1964. (Reprinted from Journal of the Malacological Society of Australia, no. 8, Dec. 15, 1965, pp. 25-30.) The Australian Museum, College St., Sydney, N. S. W., Australia.

#### NETS:

"Comparative efficiencies between amilan net and cotton net for small beam trawlers and surrounding seines," by C. Miyazaki, article, IPFC Current Affairs Bulletin, no. 41, Dec. 1964, pp. 14-27, illus., printed. Indo-Pacific Fisheries Council, Food and Agriculture Organization of the United Nations, Malawan Mansion, Phra Atit Rd., Bangkok, Thailand.

#### NORTH PACIFIC:

Outline of the Northern Water Fisheries, 95 pp., printed in Japanese, Feb. 1965. Japan Fisheries Society, 17-banchi, 1-chome, Nagata-cho, Chiyoda-ku, Tokyo, Japan.

#### NORWAY:

"Den Norske hermetikkindustri i 1964" (The Norwegian canning industry in 1964), by Trygve Orre and Olav Omeland, article, Tidsskrift for Hermetikindustri (Norwegian Canners Export Journal), vol. 51, no. 2, Feb. 1965, pp. 49-53, printed in Norwegian and English. Reviews production and export of Norwegian canned fishery products in 1964. Covers the landings, canned pack, and prices of kippered herring, brisling, small sild, mackerel, and shellfish. Discusses the export market, which showed an overall increase in both volume and value during 1964. However, exports to the United States declined, while those to the United Kingdom increased because of a reduction in import duties. Because of tightening world competition in canned fishery products, the Norwegian industry had to reduce sales prices and the margin of profit was consequently diminished. Norwegian canners are

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concerned about the outlook for sales to the European Common Market.

#### NORWAY POUT:

The Stocks of TRISOPTERUS ESMARKII (Nilsson) off North-west Scotland and in the North Sea, by D. F. S. Raitt, Marine Research 1965 No. 1, 24 pp., illus., printed, 7s. 6d. (about US\$1.05). Department of Agriculture and Fisheries for Scotland, Edinburgh, Scotland. (For sale by the Sales Section, British Information Services, 845 Third Ave., New York, N. Y. 10022.)

#### OCEANOGRAPHY:

Catalog of Data in World Data Center A: Oceanography, Suppl. No. 1 (Data received during the period, 1 January to 30 June 1964), printed, 1964. World Data Center A: Oceanography, 1st and N Sts. SE., Washington, D. C.

"Inner space: the oceans," by Barbara Tufty, article, Science News Letter, vol. 87, no. 3, Jan. 16, 1965, pp. 42-43, illus., printed, 15 cents. Science Service, Inc., 1719 N St. NW., Washington, D. C. 20036.

The International Indian Ocean Expedition, by J. V. Leyendekkers, 9 pp., illus., printed. (Reprinted from The Australian Journal of Science, vol. 27, no. 6, Dec. 1964, pp. 153-161.) Division of Fisheries and Oceanography, Commonwealth Scientific and Industrial Research Organization, Cronulla, N.S.W., Australia.

"Oceanographic instrumentation heads for major expansion," by Charles W. Covey, article, Under Sea Technology, vol. 6, no. 4, April 1965, pp. 20-21, printed, single copy \$1.00. Compass Publications, Inc., 617 Lynn Bldg., 1111 No. 19th St., Arlington, Va. 22209.

Oceanographical Observations in the Indian Ocean in 1962, H.M.A.S. DIAMANTINA (Cruise Dm 2/62), Oceanographical Cruise Report No. 15, 120 pp., illus., processed, 1964. Division of Fisheries and Oceanography, Commonwealth Scientific and Industrial Research Organization, Melbourne, Australia.

Progress in Oceanography, vol. 2, edited by Mary Sears, 271 pp., illus., printed, 80s. (about US\$11.20). A Pergamon Press book. The Macmillan Company, 60 Fifth Ave., New York, N. Y. 10011. Contains a research report on the distribution of phosphorus and oxygen in the Atlantic Ocean, 1957-58; an article about the distribution of zooplankton in the sea; a historical account of deep-sea expeditions and research vessels, 1873-1960; and a survey of marine bottom samplers.

"Soviet oceanography today," by T. K. Treadwell, Jr., article, United States Naval Institute Proceedings, vol. 91, no. 5, May 1965, pp. 26-37, illus., printed, single copy 75 cents. United States Naval Institute, Annapolis, Md. 21402.

Studies with the Woodhead Sea-Bed Drifter in the Southern North Sea, by Peter Woodhead, Laboratory Leaflet (New Series) No. 6, 8 pp., illus., processed, Feb. 1965. Fisheries Laboratory, Ministry of Agriculture, Fisheries and Food, Lowestoft, Suffolk, England.

Summary of the Work of the Second Indian Ocean Expedition of the Azov and Black Sea Research Institute of Marine Fisheries and Oceanography, by B. S. Solov'ev, JPRS 23394, 6 pp., illus., processed, 1964. (Translated from the Russian, Okeanologia, vol. 3, no. 5, 1963.) Joint Publications Research Service, U. S. Department of Commerce, Bldg. Tempo E, E. Adams Dr., 4th & 6th Sts. SW., Washington, D. C. 20443.

"U. S. oceanographers visit the Soviet Union," by T. K. Treadwell, Jr., article, Oceanus, vol. 11, no. 3, April 1965, pp. 14-17, illus., printed. The Woods Hole Oceanographic Institution, Woods Hole, Mass.

World Beneath the Waves, by Walter Buehr, 112 pp., illus., printed, 1964, \$3.25. W. W. Norton & Co., 101 Fifth Ave., New York, N. Y. 10003. Discusses different aspects of the ocean and oceanography. For grades 4 to 7.

#### O.E.C.D.:

Subsidies and Other Financial Support to the Fishing Industries of OECD Member Countries (Adopted by the Committee for Fisheries and Approved by the Council at Its Meeting on the 21st July 1964), 254 pp., printed, Jan. 1965. O.E.C.D. Publications Office, 2, rue Andre-Pascal, Paris 16e, France. This report is the result of a decision of the Fisheries Committee of the Organization for Economic Cooperation and Development to devote most of its 1962/63 program to studying: "The policies of Member countries regarding subsidies and other financial support in order to determine whether they are compatible with rational production and possibilities of sales, and/or whether they are a hindrance to the free development of competition and to desirable cooperation between the various Member countries." Member countries of O.E.C.D., established on Sept. 30, 1961, are Austria, Belgium, Canada, Denmark, France, the Federal Republic of Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States. The book is divided into 3 parts. First, the general part discusses overall aspects of support projects--their objectives, financial methods, costs, and results for fishing fleets, fishery production, and international trade. It also summarizes findings on the feasibility of the abolition of financial supports: "They tend to create, or to help to perpetrate, abnormal conditions for the industry and, after a time, there may be no other alternative but to maintain these artificial conditions. As time goes by, it becomes increasingly difficult to revert to free competition. The very existence of subsidies often calls for yet further subsidies both at national and international level." The second part presents recommendations for each country by the O.E.C.D. Council. The third part contains the country chapters--each consisting of a survey of the various support schemes such as aid to vessel construction, price supports for fishery products, loans from government funds for purchase of gear, and other projects; and a general evaluation of those projects in that country. The annexes include a summary list of financial support schemes for fishing industries in O.E.C.D. countries; and statistical tables showing landings in those countries, 1956-61. This is a basic reference book on government assistance to fisheries in Europe and North America, and will be invaluable

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to administrators and of great interest to fishing industry people in those regions.

#### OREGON:

A Study of the Feasibility of Developing Small Boat Harbors in Six Oregon Counties, 106 pp., illus., processed, Feb. 1965, 50 cents. Area Redevelopment Administration, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) The purpose of the study was to determine the feasibility of developing small boat harbors and related marine facilities suitable for commercial fishing and recreational boating in 6 ARA-designated counties in the State of Oregon.

#### OYSTERS:

"Ancient oyster shells on the Atlantic Continental Shelf," by Arthur S. Merrill, K. O. Emery, and Meyer Rubin, article, *Science*, vol. 147, no. 3656, Jan. 22, 1965, pp. 398-400, illus., printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005.

Glucose Nutrition and Longevity in Oysters, by Larry Gillespie, R. M. Ingle, and Walter K. Havens, 10 pp., illus., printed, Dec. 1964. (Reprinted from *Quarterly Journal of the Florida Academy of Sciences*, vol. 27, no. 4, Dec. 1964, pp. 279-288.) Florida Academy of Sciences, University of Florida, Gainesville, Fla.

#### PACIFIC OCEAN:

A Conference on Joint Investigations of the Flora and Fauna of the Western Pacific, by Ia. I. Starobogatov, JPRS 23396, 4 pp., processed, 1964. (Reprinted from *Okeanologia*, vol. 3, no. 5, 1963.) Joint Publications Research Service, U. S. Department of Commerce, Bldg. Tempo E., E. Adams Dr., 4th & 6th Sts. SW., Washington, D. C. 20443.

Proceedings of the Tenth Pacific Science Congress, Honolulu, Hawaii, 1961, edited by Leonard D. Tut-till, 474 pp., illus., printed, 1963. Bishop Museum Press, Honolulu, Hawaii. Report of the 10th Pacific Science Association Congress, held at the University of Hawaii, Aug. 21-Sept. 6, 1961. Included in the section of biological sciences are listings of papers under the divisions of limnology and fresh-water fisheries and of marine biology and fisheries. Among reports of standing committees are those on conservation, fresh-water sciences (including limnology, fisheries, and biology subcommittees), and marine sciences (includes subcommittee on nomenclature of the seabottom). Contains several papers on biology and oceanography of the Pacific area.

#### PARASITES:

Parasitic Copepods from Marine Polychaetes of Eastern North America, by Jorgen Lutzen, *Travaux sur les Pêcheries du Québec* No. 7, 14 pp., printed in English with French abstract, 1964. Division des Pêcheries, Ministère de l'Industrie et du Commerce, Québec, Canada.

#### PERU:

Reports, processed in Spanish, of the Library, Instituto de Investigación de los Recursos Marinos, P. O. Box 3734, Lima, Peru. Limited distribution.:

Abundancia de los Huevos de Anchoveta (ENGRAULIS RINGENS) con Relación a la Temperatura de Mar en la Región de Chimbote (Abundance of Anchovy Eggs with Relation to the Temperature of the Sea in the Region of Chimbote), by Blanca Rojas de Mendiola, Informe No. 25, 39 pp., illus., 1964.

Análisis Técnico de la Industria de Harina de Pescado en el Perú (A Technical Analysis of the Peruvian Fish Meal Industry), by E. Arnesen and J. Sanchez, Informe No. 13, 32 pp., illus., 1963.

Aprovechamiento de la Materia Prima en la Elaboración de Harina de Pescado Tipo Integral, Estudio Técnico--Economico de Dos Metodos (Utilization of the Raw Material in the Production of Coarse Fish Meal, Technical Study--Economics of Two Methods), by T. Sparre and E. Arnesen, Informe No. 17, 20 pp., illus., 1963.

Costos y Beneficios en la Industria de la Pesca de Anchoveta 1962 (Costs and Profits of the Anchovy Industry, 1962), by I. Tilic, Informe No. 21, 65 pp., illus., 1963.

El Desarrollo de un Puerto Pesquero Modelo en el Departamento de Lambayeque--Conferencia Dada el Día 15 de Enero de 1964 en el Club Lambayeque, Lima (The Development of a Model Fishing Port in the Department of Lambayeque--Conference Held on January 15, 1964, in the Club Lambayeque, Lima), by T. Sparre, Informe No. 23, 16 pp., illus., 1964.

La Industria Pesquera de la Anchoveta--Informe Presentado al Gobierno del Perú en Setiembre 1962 (The Anchovy Fishing Industry--Report Presented to the Government of Peru in September 1962), Informe No. 11, 23 pp., illus., 1963.

Marcación de Cachalotes Frente al Perú (Marking of Sperm Whales Along the Coast of Peru), by Jorge Mejia, Informe No. 26, 20 pp., illus., 1964.

El Mercadeo del Pescado en Lima: Preferencias de los Consumidores (The Marketing of Fish in Lima: Consumer Preferences), by W. F. Doucet and J. E. García C., Informe No. 19, 71 pp., illus., 1963.

Métodos Analíticos para el Control de Producción de Harina y Aceite de Pescado (Analytical Methods for the Control of Fish Meal and Oil Production), by T. Sparre, J. Sanchez, and R. Lam, Informe No. 20, 29 pp., 1963.

La Pesca de la Anchoveta: Estadística de Pesca y Esfuerzo durante los Meses de Enero-Junio de 1963 (The Anchovy Fishery: Statistics of the Fishery and Fishing Effort, January-June 1963), by Isaac Vasquez Aguirre and I. Tzukayama, 39 pp., illus., 1964.

#### PHILIPPINES:

Fisheries Statistics of the Philippines, 1963, 109 pp., printed, 1964. Fisheries Economics and Statistics Section, Fisheries Research Division, Philippine Fisheries Commission, Department of Agriculture and Natural Resources, Quezon City, Philippines.

"Good catch in Philippines," by William P. Hunt, article, *International Commerce*, vol. 71, no. 16, April 19, 1965, pp. 7-8, illus., printed, single copy 35 cents.

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Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Reviews the current situation in the Philippine fishing industry; origin and operation of various types of gear used; the need for refrigeration facilities; and possibilities for sale of United States vessels, gear, and machinery. The Philippine Republic has vast fishery resources but the domestic industry is still underdeveloped; production of fishery products is far below national requirements, and the country is still importing about \$12 million worth of canned fish each year. However, there were plans for two canneries under construction to start production by June 1965. The small boat industry is developing to the extent that new boatyards are being built and some of the older plants are being enlarged. One corporation from Negros is interested in purchasing three combination vessels for purse seining and trawling. Philippine business firms have indicated many other needs: pumps for unloading fish; machines to manufacture nets; facilities to can tuna, sardines, and other products; and dehydrators and mill grinders to produce fish meal.

#### PHYSIOLOGY:

"Application of gas-liquid chromatography to the fat metabolism of fish," by Raul O. Peluffo, article, Chemical Abstracts, vol. 59, Nov. 25, 1963, Abstract No. 13163b, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

#### POLLUTION:

Report on Investigation of Fish Kills in Lower Mississippi River, Atchafalaya River, and Gulf of Mexico, 26 pp., processed, 1964. Division of Water Supply and Pollution Control, Public Health Service, U. S. Department of Health, Education, and Welfare, Washington, D. C. 20201.

#### POND FISHERIES:

Fish Harvest by Wire Nets in a Stream Impoundment, by Carl Baker, Publication W-323, 14 pp., illus., printed, 1963. Division of Wildlife, Ohio Department of Natural Resources, Columbus, Ohio.

Problems in Pond Fishery, Collected Articles, 203 pp., printed in Russian, 1963. Rybnoe Khoziaistvo, V. Krasnosel'skaia 17, Moscow B-140, U.S.S.R.

#### PORPOISES:

"Trained porpoise released in the open sea," by Kenneth S. Norris, article, Science, vol. 147, no. 3661, Feb. 26, 1965, pp. 1048-1050, printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005.

#### PROTEIN:

"Protein typing of some authentic fish species by disc electrophoresis," by Vivian M. Mancuso, article, Journal of the Association of Official Agricultural Chemists, vol. 47, Oct. 1964, pp. 841-844, printed. Association of Official Agricultural Chemists, P.O. Box 540, Benjamin Franklin Station, Washington, D. C. 20004.

#### QUALITY:

"Measurement of hypoxanthine in fish as a method of assessing freshness," by John Spinelli, M. W. Ek-

lund, and David Miyauchi, article, Journal of Food Science, vol. 29, no. 6, 1964, pp. 710-714, printed. Institute of Food Technologists, 510-522 N. Hickory St., Champaign, Ill.

#### RADIATION PRESERVATION:

"Radiation preservation of foods," by Ferdinand P. Mehrlich, article, Science, vol. 147, no. 3665, March 26, 1965, pp. 1600, 1602-1603, printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005. Discusses a comprehensive review of radiation preservation of foods research activities throughout the world given at an international conference held Sept. 27-30, 1964, in Boston, Mass. Among other topics covered were the areas of study pursued by the U. S. Atomic Energy Commission and the Bureau of Commercial Fisheries in the field of radiation microbiology of marine products: (1) shifting ecology of the irradiated flora due to variation in irradiation resistance and the unique spoilage patterns resulting; (2) whether significant numbers of microorganisms which survive are mutants, and what their disease-producing role, if any, is; (3) extent of increase in radioresistance; and (4) cooperating radiolethal effects of food additives (such as nitrates, sodium chloride, antibiotics), concomitant heat, and other agents.

#### REFRIGERATION:

"Marine refrigerating equipment of Japanese fishing vessels," by M. Seigoro Chigusa and others, article, Bulletin de L'Institut International Du Froid, vol. 45, no. 1, 1965, pp. 25-30, printed. Institut International Du Froid, 177, Blvd., Malesherbes, Paris, France.

#### ROE:

Processing Cod Roes, by A. McK. Bannerman, Torry Advisory Note No. 18, 8 pp., printed, Aug. 1964. Torry Research Station, Department of Scientific and Industrial Research, 135 Abbey Rd., Aberdeen, Scotland.

#### SALMON:

Statistics on Salmon Sport Fishing in the Tidal Waters of British Columbia, 1964, 26 pp., processed, 1964. Department of Fisheries of Canada, 1155 Robson St., Vancouver 5, B. C., Canada.

Available from Japan Fisheries Resource Conservation Association, 6th Fl., Zenkoku Choson Kaikan Bldg., 1-17, Nagata-cho, Chiyoda-ku, Tokyo, Japan. Printed in Japanese.:

Pacific Salmon in the Northern Waters--Conditions of Stocks, Fisheries Research Series 6, No. 3, by Tomonari Matsushita, 44 pp., illus.

--Distribution and Migration, by Tomonari Matsushita, Fisheries Research Series 6, No. 2, 76 pp., illus.

Available from the Japanese Fisheries Agency, Ministry of Agriculture and Forestry, 2-1, Kasumigaseki, Chiyoda-ku, Tokyo, Japan, printed in Japanese.

Artificial Propagation and Planting of Salmon in Sakhalin, by Osamu Sano, Rakusai Separate No. 634, 6 pp., illus., Jan. 1964.

Observations on Salmon Escapement in the Soviet Far East, by Osamu Sano, Rakusai Separate No. 636, 3 pp., illus., Aug. 1964.

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#### SARDINES:

The Pilchard of South West Africa (SARDINOPS OCELLATA)--the Benguela Current off South West Africa, by G. H. Stander, Investigational Report No. 12, 120 pp., illus., printed, 1964. Marine Research Laboratory, Administration of South West Africa, Windhoek, South West Africa.

#### SCALLOPS:

Notes on Escallops and Details of the Baird Sledge Dredge and Its Handling, Laboratory Leaflet (New Series) No. 5, 10 pp., illus., processed, Feb. 1965. Fisheries Laboratory, Ministry of Agriculture, Fisheries and Food, Burnham-on-Crouch, Essex, England.

Scallop Survey New Brunswick, 1964, 7 pp., printed, 1964. Department of Fisheries, Ottawa, Canada.

"Seasonal variations in the sterol, fat and unsaponifiable components of scallop muscle," by D. R. Idler, T. Tamura, and T. Wainai, article, Journal of the Fisheries Research Board of Canada, vol. 21, Sept. 1964, pp. 1035-1042, printed, single copy C\$2. Queen's Printer and Controller of Stationery, Ottawa, Canada.

#### SEA LION:

"Underwater visual discrimination by the California sea lion," by Ronald J. Schusterman, Winthrop N. Kellogg, and Charles E. Rice, article, Science, vol. 147, no. 3665, March 26, 1965, pp. 1594-1596, illus., printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005.

#### SEALS:

Collection of Scientific Papers 1962. The Greenland Seal and Hooded Seal, 138 pp., printed in Russian, 1963. Severnoe Otdelenie, PINRO, Knigoizdat, Archangel, U.S.S.R.

Seals of the World, by Judith E. King, 170 pp., illus., printed, 1964, 11s. plus postage (about US\$1.70). Trustees of the British Museum (Natural History), Cromwell Rd., London S.W.7, England. The biology of seals is covered quite extensively in this book. The author in her introduction points out that "seal" is a term that is used very loosely, and this group of animals can easily be subdivided and the members called, more precisely, sea lions, fur seals, and true seals. The first part of the book deals with the details of this classification and lists the common and scientific names of all 32 species. Then an account is given of each seal, its distribution and general life history, food, habits, and commercial exploitation. Described are the sea lions of the North and South, fur seals (including the Pribilof and southern fur seals), walrus, true seals of the North, Antarctic seals, and monk, elephant, and hooded seals. The chapters that follow deal with distribution and currents; external shape and locomotion; skin, fur, molt, temperature; skull and skeleton; dentition and age determination; alimentary canal, liver, kidney; respiratory system; vascular system; reproductive organs; brain and nervous system; senses; diving; and fossils. Appendices include a list of internal and external parasites, and the origins of the scientific names. Also included is a list of references for those interested in fur-

ther reading. A frontpiece shows some early illustrations of seals. Anyone interested in learning more about seals will find a wealth of information in this book.

--J. Pileggi

#### SEYCHELLES ISLANDS:

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"A report on the survey of tuna," by A. G. York, article, Commercial Fishing, vol. 3, no. 7, March 1965, pp. 31, 33, 34, illus., printed. Trade Publications Ltd., 47 Lewis Eady Bldg., Queen St., Auckland, New Zealand. Presents results of 15 months of tuna investigations by the New Zealand Marine Department. In general, tuna are temperature-conscious and usually migrate to inshore waters via defined "warm water highways." Wherever a "thermocline" (a cold water layer of varying depth) is present, a depth barrier for tuna is formed. Therefore, the most efficient method of fishing must be based on knowledge of the presence and depth of the thermocline. In addition to water temperature changes recorded in the course of several cruises, information on salinity, acoustics, catching techniques, and general distribution of the four species common to New Zealand waters (southern bluefin, albacore, skipjack, and yellowfin) is presented in this article.

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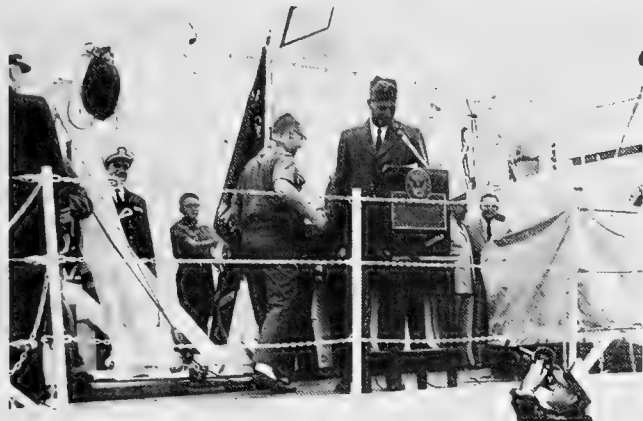
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### MERIT BADGE IN OCEANOGRAPHY AWARDED TO BOY SCOUTS

A new honor--the Merit Badge in Oceanography--was recently awarded for the first time to more than 40 Boy Scouts and Explorers. At ceremonies aboard the oceanographic research vessel USNS Gilliss of the Military Sea Transport Service (MSTS) at Washington, D. C., the Scouts and Explorers were presented their badges in the new science by Rear Admiral Denys W. Knoll, Oceanographer of the United States Navy.



Boy Scout being awarded Merit Badge in Oceanography aboard research vessel USNS Gilliss.

The new Merit Badge in Oceanography was established in 1963 with the cooperation of the Chief of Naval Operations, the Oceanographer of the Navy, scientists from the U. S. Coast and Geodetic Survey, and other private institutions and universities.

It was most fitting that the Boy Scouts and Explorers were awarded the badges aboard the USNS Gilliss while the vessel was visiting the Nation's Capital, following oceanographic surveys in the Caribbean. She was named for Captain James M. Gilliss, USN, whose scientific pioneering as Superintendent of the Naval Observatory in the Civil War Years from 1861 to 1865 led to a greater knowledge of the sea. (Sealift, MSTS, Washington, D. C., January 1965.)



### GUIDE TO TROPICAL ATLANTIC SEA BIRDS

A contract with the Smithsonian Oceanographic Sorting Center to prepare and publish an illustrated guide to the birds of the tropical Atlantic has been negotiated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Washington, D. C. The publication will include descriptions of each of the common species of sea birds of the tropical Atlantic along with both black and white illustrations and color pictures to assist in identification of those birds by scientists and crew members aboard the Laboratory's research vessels. Specimens of sea birds were collected by laboratory staff members aboard the Bureau's research vessel Geronimo. An ornithologist of the Smithsonian Institution made one collection trip aboard the Bureau's research vessel.

Interest of fishery scientists in sea birds is generated by the fact that, in tropical waters, a "working" flock of birds usually means a tuna school. The tuna feed on shoals of small fish which they crowd to the surface. When tuna are at the surface the birds work low over the water in a frenzy of diving, swooping, and circling. Such bird flocks can be seen at distances of from 3 to 5 miles, whereas the best sonar currently available can pick up tuna schools at a distance of less than 1 mile.

## SO WHAT'S NEW WITH BURGERS AND BARBECUE?--SALMONBURGERS

Burgers and barbecue are about as common at a cookout as hot dogs at the ball park. But for a new taste, new look, new everything for the cookouts this summer, try fish and shellfish.

It all started when a group of inquisitive Home Economists of the U. S. Department of the Interior's Bureau of Commercial Fisheries decided to completely remake the burger. From this venture came a salmonburger that turns the commonplace into the classic.

Salmonburgers combine can-venience with convenience for a cookout classic that's easy, economical, and highly nutritious. Burgers are molded from a mixture of canned salmon, chopped onion, bread crumbs, egg, sweet pickle, and mayonnaise, then fried to a sizzling goldenbrown in a skillet over the coals. Here is the recipe.



Salmonburgers on the griddle. In the pot is Tuna Barbecue, hearty chunks of canned tuna with a tangy easy-to-fix barbecue sauce.

## SALMONBURGERS

1 can (1 pound) salmon	1 teaspoon powdered mustard
$\frac{1}{2}$ cup chopped onion	$\frac{1}{2}$ teaspoon salt
$\frac{1}{4}$ cup melted fat or oil	$\frac{1}{2}$ cup dry bread crumbs
$\frac{1}{3}$ cup salmon liquid	$\frac{1}{3}$ cup mayonnaise or salad dressing
$\frac{1}{3}$ cup dry bread crumbs	1 tablespoon chopped sweet pickle
2 eggs, beaten	6 buttered hamburger rolls
$\frac{1}{4}$ cup chopped parsley	

Drain salmon, reserving liquid. Flake salmon. Cook onion in fat until tender. Add salmon liquid, crumbs, egg, parsley, mustard, salt, and salmon; mix well. Shape into 6 burgers. Roll in crumbs. Fry in hot fat in a heavy fry pan about 4 inches from hot coals for 3 minutes. Turn carefully and fry for 3 to 4 minutes longer or until brown. Drain on absorbent paper. Combine mayonnaise and pickle. Place burgers on bottom half of each roll. Top with approximately 1 tablespoon mayonnaise mixture and top half of roll. Serves 6.

The recipe is from a 24-page, full-color, outdoor cookery booklet (Fish and Shellfish - OVER THE COALS) recently released by the Interior Department's Bureau of Commercial Fisheries. For 40 cents you can buy a copy from the Superintendent of Documents, Washington, D. C. 20240.



## **HIGHLIGHTS IN THIS ISSUE (JULY 1965)**



Landing of large cod at Boston Fish Pier in 1960.

### **Features**

THE U. S. COD FISHERY IN THE NORTH-WEST ATLANTIC--A historic fishery (page 1)

SOME OBSERVATIONS ON PENAEID SHRIMP OFF EASTERN VENEZUELA -- A potential fishery (page 12)

### **Trends in the United States Fisheries**

TUNA--Catch forecasts for the 1965 Hawaiian summer skipjack fishery (page 19) and the California bluefin and albacore fishery (page 49)

SWORDFISH AND TUNA--Exploratory fishing with longlines in the North Atlantic (page 32) and South Atlantic (page 47)

SHRIMP--Electrical trawling tests recorded on movie film (page 24)

GREAT LAKES--Exploratory fishing points the way toward expanded chub and alewife fishery (page 22)

FOREIGN TRADE--Imports accounted for half of 1964 U. S. supply of fishery products (page 50)

Also in this issue: Market reports, including inventory situation for canned salmon, canned Maine sardines, and industrial products--Reports on new vessels--Summaries of State and Federal actions affecting fisheries--and news of fisheries research on all coasts.

### **Reports on Foreign Fisheries**

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FOREIGN FISHING OFF UNITED STATES COASTS--Soviet and Japanese fishing in Bering Sea and Gulf of Alaska (page 15); Soviet fishing in North Atlantic (page 30)  
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CUBA--Tuna fisheries expansion planned (page 64)

JAPAN--A comprehensive survey of Japan's major fisheries--tuna, salmon, crab, shrimp, groundfish--with export targets for fiscal year 1965 (pages 68-82)

ICELAND--Trawling fleet continues to decline (page 66)

AFRICA--Fish protein concentrate produced in Morocco (page 87) and South Africa Republic (page 91)

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Fishes

# COMMERCIAL FISHERIES REVIEW



VOL. 27, NO. 8

AUGUST 1965

**UNITED STATES DEPARTMENT OF THE INTERIOR**  
**Fish and Wildlife Service**  
**Bureau of Commercial Fisheries**  
**Washington, D.C.**





# COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries  
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor  
G. A. Albano and H. Beasley, Assistant Editors

Address correspondence and requests to the: Chief, Fishery Market News Service, U.S. Bureau of Commercial Fisheries, 1815 North Fort Myer Drive, Room 510, Arlington, Va. 22209.

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5/31/68

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# COMMERCIAL FISHERIES REVIEW

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## HERRING FISHERY IN SOUTHEASTERN ALASKA

By Stephen H. Rogers\*

A limited fishery for herring (*Clupea harengus pallasii*) exists in Southeastern Alaska (see table). The herring is processed for meal and oil.

Herring Catch in Alaska <sup>1/</sup>		
Year	Catch	Value
	1,000 Lbs.	\$
1964	50,000 <sup>2/</sup>	-
1963	31,216	468,240
1962	33,876	379,320
1961	49,465	559,020
1960	77,913	835,675

<sup>1/</sup>Includes catch used for bait.  
<sup>2/</sup>Preliminary figure.

One plant located at Washington Bay can process 2,100 barrels<sup>1/</sup> of herring in 24 hours when running at full capacity. Oil recovery during 1964 has been unusually high with an average yield of 45 gallons per ton. About 3½ barrels of herring are required to produce 100 pounds of meal. Delivery to the plant varies with the availability of fish. When fish are available, the vessels deliver every day. The plant has two shifts; 7 workers on the day shift and 6 at night.

During 1963, only one herring reduction plant operated in Alaska; in 1964, a second plant reopened because of improvement in the market. The herring plants must produce a much larger quantity than in the past to compete with the South American meal and oil producers. One plant in Washington Bay now processes nearly four times as much herring as it did during earlier years.



Fig. 1 - When a school of herring is spotted near the surface, the seine set is started by launching the skiff which holds the end of the 250-fathom purse seine, while the seiner pays out the net and encircles the school.



Fig. 2 - The 80-foot seiner Pacific Pride. The seine used is 250 fathoms long and seven 200-mesh strips deep. The mesh size is 13½" stretched. All nylon web is used.

The fishing season for herring is from June 1 (June 15 in some areas) to February 23. Usually there is no fishing after September because the fish are not readily available to the seiners. During the first part of the 1964 season, fishing was in the Noyes Island area. Later, landings came from Turnabout Island, Gut Bay, Cape Fanshaw, and Larch Bay.

\*Fishery Aide, Exploratory Fishing & Gear Research Base, U. S. Bureau of Commercial Fisheries, Juneau, Alaska

<sup>1/</sup>One barrel of herring contains 250 pounds of fish.

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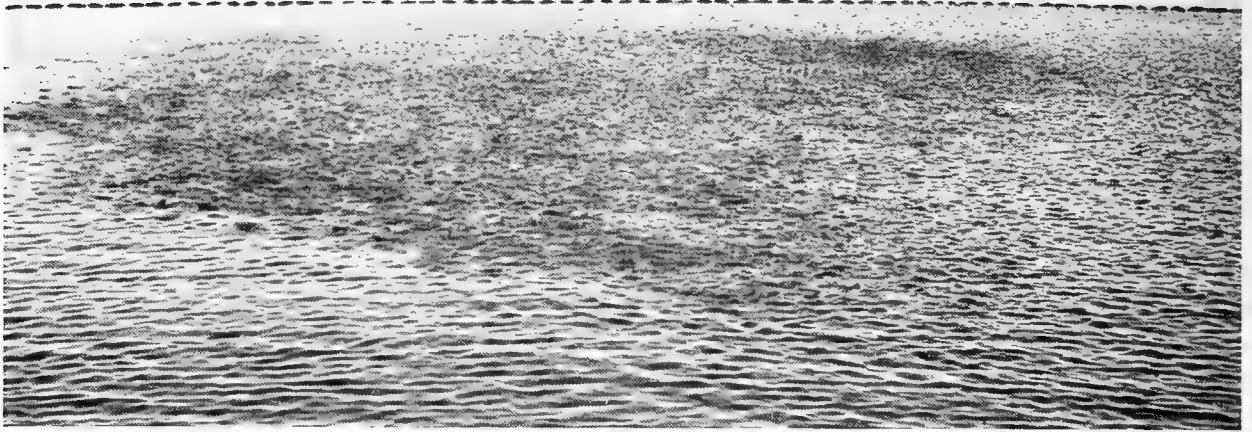


Fig. 3 - A school of herring is enclosed by the seine.

Early in the fishing season, most fishing is done during the day, while in the latter portion of the season (August and September) more night fishing is carried on. A set is made when a sufficiently large school of fish is spotted near the surface. At night, the fish are spotted by the luminescence caused when they disturb the surface of the water. The seine is set to circle the herring school. About 45 minutes is required to complete the operation. A large brailer composed of an iron ring and a nylon web bag brings the catch aboard the vessel. This net transfers up to 25 barrels of herring in a single lift.



Fig. 4 - The set is complete. The seine is now being pursed as the skiff tows the main vessel or seiner to keep her from drifting into the seine.

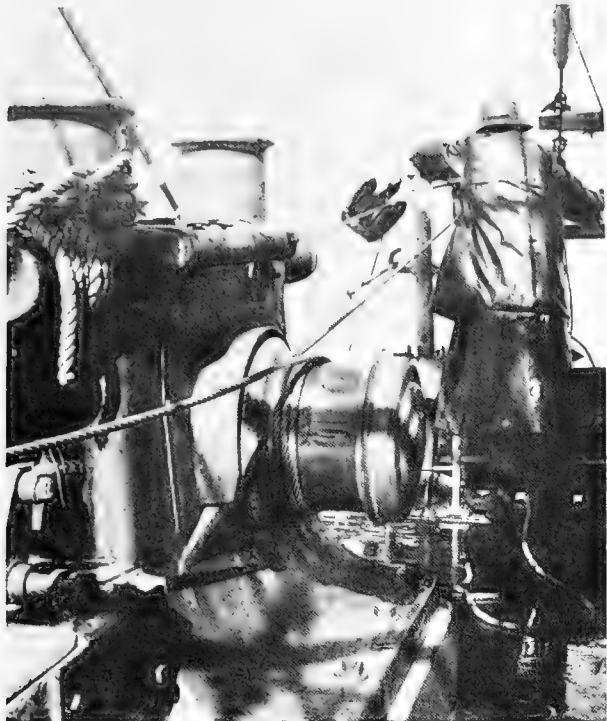


Fig. 5 - The purse cable is being winched aboard. The cable is wound on a drum.

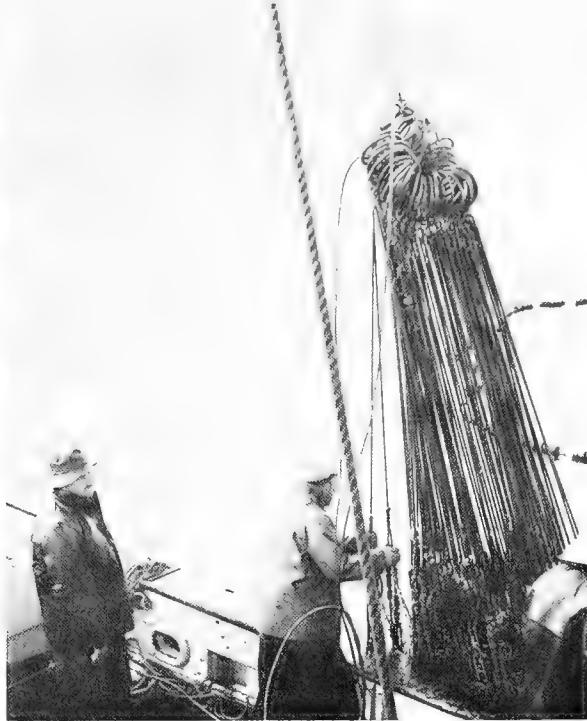


Fig. - 6 After the net is pursed, trapping the fish, the purse rings are brought aboard in preparation for hauling the seine aboard.



Fig. 7 - A power block is pulling the seine aboard. All herring seiners now use power blocks, which speed up operation considerably.

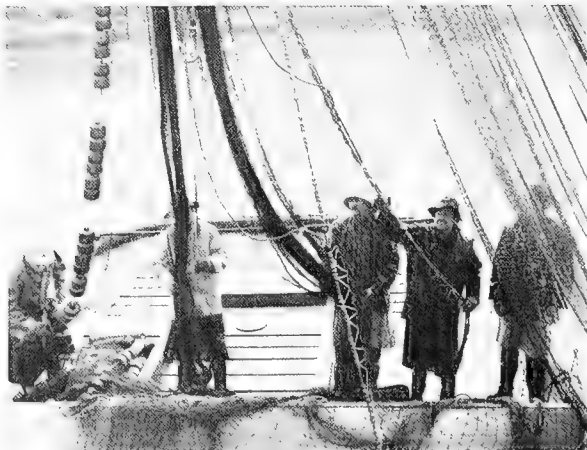


Fig. 8 - The crew of the seiner American Star is stacking the seine on the deck. An 8-man crew is employed, consisting of captain, engineer, cook, and 5 deckhands.

Nine seiners were fishing herring in Alaska in 1964; an increase of 5 vessels over 1963. All the herring vessels are similar, between 75 feet and 85 feet long. The larger vessels carry 900 to 1,200 barrels below decks.



Fig. 9 - The net is now back on the seiner's deck, except for the bunt or section containing the fish. The bunt is located at the "skiff end" of the seine. The crew is pulling the last of the seine aboard to concentrate the catch for loading the fish (brailing).



Fig. 11 - The fish are being brailed aboard with a long-handled brailer made of nylon web.

A typical seine is 240 fathoms long and seven 200-mesh strips deep ( $1\frac{3}{8}$ " mesh). The leadline is manila and the corkline is nylon with plastic floats. Some vessels use a galvanized chain leadline or polypropylene with lead weights.



Fig. 10 - A catch of about 200 barrels of herring is ready to be brailed aboard. The American Star can carry 900 barrels of herring in her hold; some of the larger vessels can carry more than 1,200 barrels.



Fig. 12 - A brailer full of fish coming aboard the seiner.

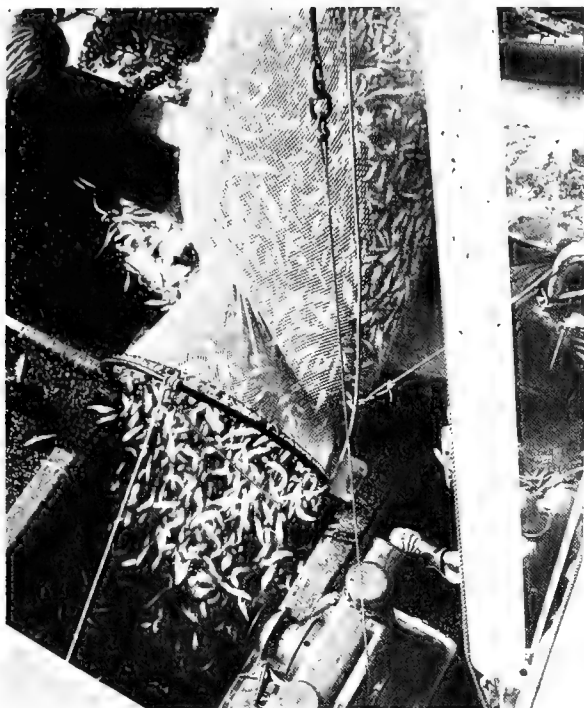


Fig. 13 - The fish are spilled into the hold.



Fig. 14 - The herring reduction plant at Washington Bay.



Fig. 16 - The fish are stored in a tank at the plant.



Fig. 15 - The herring are unloaded by conveyor from the hold of the seiner.

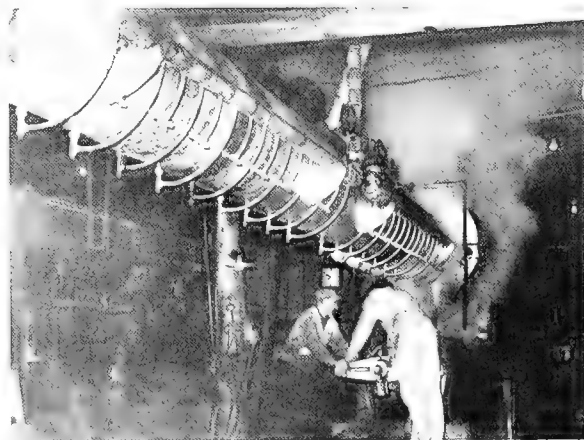


Fig. 17 - After the fish are cooked, the oil is pressed out. During 1964, most of the fish were 6 years old, with an unusually high oil content.



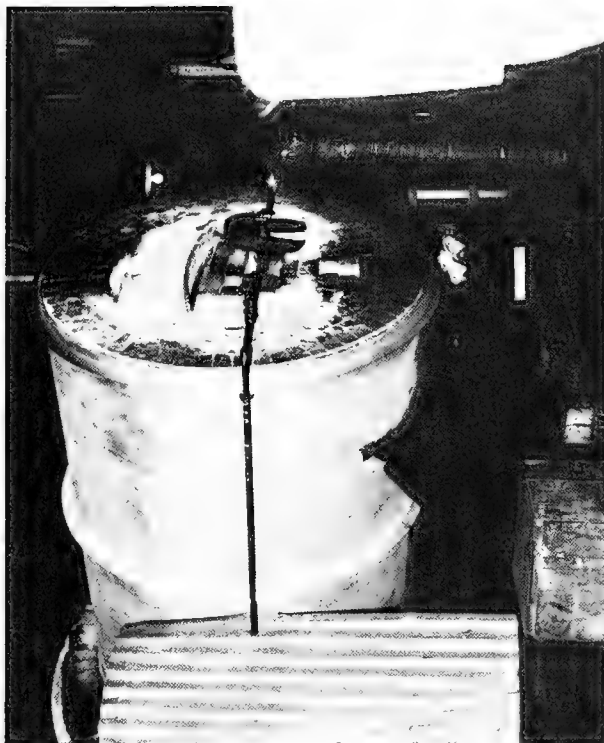


Fig. 18 - After the oil is "pressed" out, the residue is dried in a flame dryer.



Fig. 19 - The dried fish meal is being sacked.

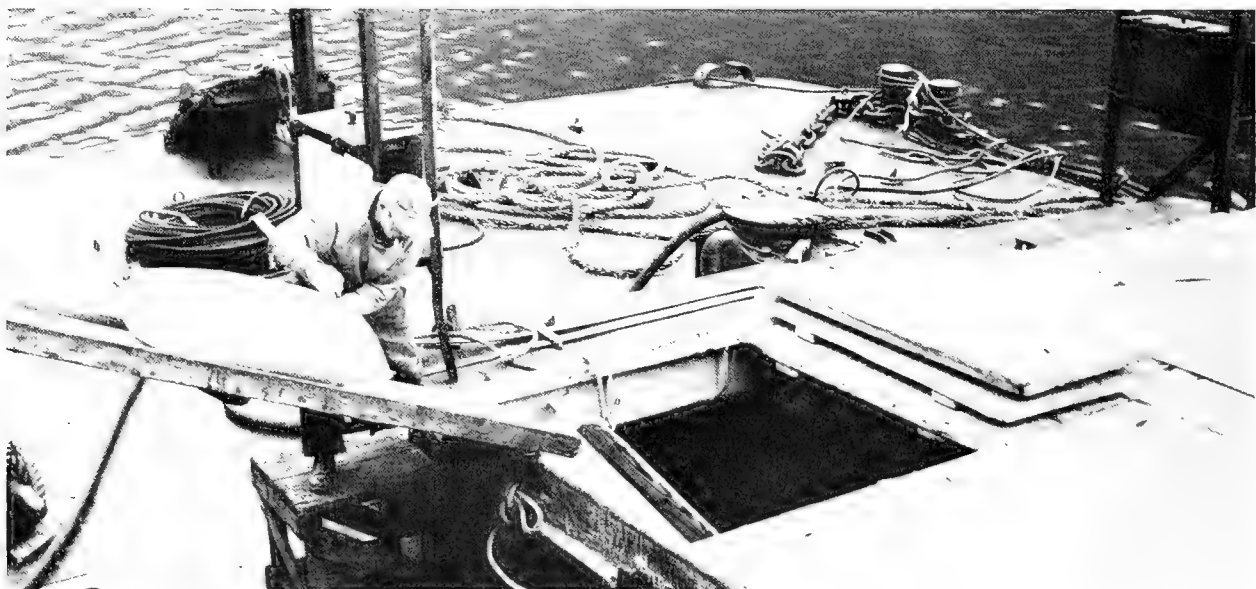


Fig. 20 - The sacks of meal are being loaded aboard a barge for shipment to Seattle.

Boat-owners from one of the plants have recently employed an airplane to spot fish but the long-term results of using this method of locating schools of fish are not yet known.





# THE YELLOWFIN TUNA FISHERY IN THE EASTERN TROPICAL ATLANTIC

## (Preliminary Study)<sup>1/</sup>

By J. C. LeGuen, F. Poinard and J. P. Troadec

(Translated from French by J. P. Wise\*)

### ABSTRACT

This study presents the results of an investigation carried out on the live-bait tuna clippers which landed their catches at Point Noire (Congo-Brazzaville) in 1964. Two-thirds of the trips were analyzed. The analysis allows us to describe the characteristics of the live-bait fishery in the region: catch per unit of effort, yield, and the gross relationship between the distribution of the concentrations of yellowfin and the oceanographic structure of the surface. Eighty percent of the catches were made in waters of 24° to 25° C. (the frontal zone). This relationship makes it possible to use knowledge of the oceanography of the surface, and its seasonal variations, in scouting for fish.

### I. INTRODUCTION

The yellowfin (*Thunnus albacares*) fishery actually began in the Point Noire (Congo-Brazzaville) area in September 1963 with the construction of cold-storage facilities. After 10 years of attempts (cruises of the vessels Laurence, Columbia, Marinero, and Bertin), there had been no commercial exploitation established because the distances between the fishing areas and the ports prejudiced the economic yield.

Since the arrival of the tuna fleet in September 1963 we have begun an investigation to determine the principal characteristics of the fishery (yields) in the region and to obtain the first estimates of the seasonal movements of the fish concentrations.

In establishing contacts with the fishing captains we tried to obtain as much information as possible about their trips: duration, position, catch, time devoted to catching bait, surface temperature, and average size of fish captured. In spite of the relative imprecision of some of the information, this method has the advantage of furnishing a synoptic picture of the situation and a large number of observations (at least in the region exploited). In addition, this type of analysis is the only one permitting the beginning of a study of the influence of exploitation on the stock.

The results of the study are particularly satisfactory in that they shed light on the problem of seasonal movements of the concentrations of yellowfin. Monthly charts<sup>2/</sup> of the relative abundance of the fish at the surface have been constructed; they furnish a partial picture of the migrations.

The work presented in this paper is the result of a rapid analysis of the data collected during 1964. This preliminary version was written with as little delay as possible in order to make the results available to the tuna fleet before the beginning of the 1965 fishing season.

### II. DESCRIPTION OF THE WORK

Our first idea was to give to the fishing skippers a log sheet to fill day by day at the same time they filled their own logs.

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<sup>1/</sup>"La pêche de l'albacore (*Neothunnus albacares* Bonnatere) dans la zone orientale de l'Atlantique intertropical - Etude préliminaire," Document No. 263 - S.R., 1965. Travaux du Centre Océanographique de l'Office de la Recherche Scientifique et Technique Outre-Mer à Pointe Noire, Direction Générale: 24, rue Bayard, Paris (8<sup>e</sup>) - Centre O.R.S.T.O.M. de Pointe Noire: B.P. 1086, République du Congo.

<sup>2/</sup>Available as an appendix attached to the reprint (Sep. No. 739) of this article.

Notes: (1) Metric tons and °C. used in this article.

(2) Certain changes have been made by the Editor to increase readability in English. Also included are slight modifications as suggested by the authors.

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Fig. 1 - Form of daily log sheet distributed for use by fishing skippers. (Original printed in French.)

We were, however, in a position to request the tonnages unloaded and weighed from the books of the lightering company in charge of operating and maintaining the port. The landings were sorted into yellowfin and skipjack before October 1964; after that date, into yellowfin, bigeye (only those individuals of a weight exceeding 30 kilograms are separated from the yellowfin), and skipjack. Therefore, all bigeye were included with the yellowfin until October, and even then some bigeye weighing less than 30 kilograms were still included with the yellowfin. In general, when the logs were well kept, the captains' estimates of the quantities caught day by day corresponded pretty well with the quantity weighed after landing. Underestimations, which varied according to the captain, were less than 5 percent; but when the logs were in-

completely filled out the underestimations could be larger. In general, the captains only remembered reasonably well the days when fishing was the best. Analysis of incomplete logs caused us certain difficulties, and we were obliged to make estimations. In those cases for which we had the fishing locality, the monthly catches by statistical square were extrapolated in applying the relationship between landings and estimated catches.

The catches in the region under study were greater than the amount of fish landed for these reasons: (a) practically none of the Japanese boats unloaded at Point Noire, (b) some transfer to refrigerator ships took place at sea, and (c) in February-March and in November, when the fleet was fishing in the north, the tuna caught in the study region were unloaded at Abidjan or Dakar. On the other hand, few catches made in other regions were unloaded at Point Noire.

This type of study cannot be complete unless the same work is carried out in all the ports where west African tuna are discharged: Tema, Abidjan, Dakar, and Las Palmas.

Our study only deals with the live-bait fishery. We have data on only one trip by a seiner and two trips by long-liners.

### III. PRINCIPAL CHARACTERISTICS OF THE LIVE-BAIT FISHERY IN THE EASTERN TROPICAL ATLANTIC

1. QUANTITIES LANDED - DISTRIBUTION OF THE CATCHES BY SPECIES AND BY NATIONALITIES: In 1963, from September to December, 1,178 tons were landed, the result of 14 trips for which we have only fragmentary information.

In 1964 we have information on 6,875 tons, which is a little more than actually landed because we occasionally obtained information on trips which did not land at Point Noire (table 1).

Table 1 - Tuna Landings at Point Noire, 1964

Species	French			Japanese			Spanish			Total		
	Tons	%	Trips	Tons	%	Trips	Tons	%	Trips	Tons	%	Trips
Yellowfin	5,818.2	98.1	97	339.4	-	5	563.0	-	11	6,720.6	97.8	113
Bigeye	16.7	0.3	97	-	-	-	-	-	11	16.7	0.2	113
Skipjack	94.5	1.6	97	8.4	-	5	34.8	-	11	137.7	2.0	113
Total	5,924.4	86.2	97	347.8	5.1	5	597.8	8.7	11	6,875.0	100.0	113

In the Spanish catches the trip made by the seiner Lerez is included (85.1 tons of yellowfin and 8.3 tons of skipjack in 6 days). Two trips by Japanese long-liners are not included in the table, because that type of fishing is carried out on different stocks (albacore and yellowfin). Since the information we have on these types of fishing is very fragmentary, we have not treated them separately.

Table 1 shows the primary importance of the yellowfin in the catches (98 percent of the total), however that percentage is slightly overestimated because, as we have previously pointed out, some bigeye are included. The skipjack and the large bigeye make up the other 2 percent; those species are little sought after, particularly by the French fishermen, because they are of much less commercial value than the yellowfin.

We may note the importance of the French fishery (86.2 percent of the total). Although our data for the Spanish vessels are correct, the same cannot be said for the Japanese catches. Though the latter are considerably the more important, they transfer their catches directly at sea or land at other ports (Tema and Las Palmas). The Spanish vessels fish by preference from Abidjan, where they have a cold-storage facility. For this reason they do not usually come into the region that we have studied. The landings by the fishermen of those two nationalities (Spanish and Japanese) are too small to consider the differences in the species composition by nationality.

Our studies permit us to sum up the data on the catch of 4,194 tons (or 70 of the 113 trips) landed at Point Noire (table 2).

Table 2 - Landings at Point Noire of 70 of the 113 Tuna Trips Reported in 1964

Species	French		Japanese		Spanish		Total	
	Live-Bait				Seiner	Live-Bait		
	Tons	%	Tons	%	... (Tons) ...		Tons	Trips
Yellowfin	3,747.8	98.5	261.7	-	85.1	25.4	4,120.0	70
Bigeye	18.0	0.5	-	-	-	-	18.0	70
Skipjack	36.3	1.0	10.4	-	8.3	1.0	56.0	70
					93.4	26.4		
Total	3,802.1	90.6	272.1	6.5		119.8 (2.9%)	4,194.0	70

The data from the French vessels proved satisfactory. The distribution of the catches by species is very similar to that of the overall landings. By nationality the Spanish fishermen are slightly under-represented.

We must admit that our coverage of the landings varied with time. The rela-

tion  $\frac{\text{Tonnage covered}}{\text{Tonnage landed}}$ , very small in January and February, thereafter increased regularly to June,  $R = \frac{1}{8}$ ; July-August,  $R = \frac{1}{2.6}$ ; September-October,  $R = \frac{1}{1.5}$ ; November-December  $R = 1$ .

2. CATCH PER UNIT EFFORT BY LIVE-BAIT BOATS: The 70 log sheets for 1964 were grouped by month, assigning each trip to the month in which the mid-point of the trip occurred. Their distribution is condensed in table 3.

Table 3 - Summary of Basic Information Collected from 70 of the 113 Tuna Trips Landed at Point Noire

Table 3 - Summary of Basic Information Collected from 70 of the 113 Tuna Trips Landed at Point Noire														
1964 Month	No. of Trips	Average Length of Trip	Average Catch of Tuna Per Trip	BAIT FISHING			TUNA FISHING					Total Time at Sea (Bait and Tuna Fishing) by All Trips	Tuna Catch Per Day by All Trips	
				Total Catch 1/ Tons	Total Time Spent Fishing and Steaming 2/ Days	Percentage of Total Time at Sea %	Total Catch 3/ Tons	Steaming +Scouting +Fishing 4/ Days	Percentage of Total Time at Sea %	Time Spent only in Tuna Fishing 5/ Days	%		For Total Time at Sea Tons/Day	Actually Spent Tuna Fishing Tons/Day
January	1	30.0	45.0	105 x 70 33	0	-	45	30	100.0	25	83	30	1.5	1.8
February	2	27.5	23.5		10	17.5	47	47	82.5	20	35	57	0.8	2.4
June	2	23.5	58.0		1	2.1	116	46	97.9	30	64	47	2.5	3.9
July	3	20.3	83.0		16	22.5	250	55	87.5	22	31	71	3.5	11.7
August	7	18.8	77.4		25	18.9	542	107	81.1	53	40	132	4.1	10.4
September	23	21.3	68.0		69	15.4	1,567	380	84.6	269	60	449	3.5	5.8
October	19	19.8	52.3		114	30.3	994	262	69.7	175	46.5	376	2.6	5.7
November	11	21.6	47.0		56	23.5	517	182	76.5	117	64	238	2.2	4.4
December	2	22.0	58.0		7	15.9	116	37	84.1	22	50	44	2.6	5.3
Total	70	20.6	60.0		230.0	298	20.0	4,194	1146	80.0	733	50	1,444	2.9

1/Not possible to calculate catch by month since only 33 of the 70 trips reported the amount caught. Total bait catch by 33 trips was 105 tons.

2/Time devoted (steaming and fishing) to catching bait.

3/Yellowfin made up 98.5 percent of the catch; balance was bigeye and skipjack.

4/Time spent for steaming, scouting, and fishing for tuna.

5/Time spent actually fishing tuna. But values are overestimated because in some instances information obtained did not separate time spent scouting from time fishing.

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5/Time spent actually fishing tuna. But values are overestimated because in some instances information obtained did not separate time spent scouting from time fishing.

The analyses of the monthly data in table 3 leads to some interesting conclusions. The quantities for the months of January, February, June, July, and December are so small that they support only speculation. The data for August, September, October, and November are considerably more significant; the fishing and our coverage were considerably more intensive.

(a) Bait: DIFFICULTIES: Of the 1,444 days at sea for the 70 trips, 298 days (20 percent) were used in bait fishing. The percentage is generally small, but in October, 30.3 percent of the time at sea was devoted to bait fishing. There are two reasons for this: (1) the difficulty of getting suitable bait in the fishing areas themselves; and (2) with the movement of the yellowfin towards the south and the impossibility of getting bait off the Angolan coast, the distance between the fishing areas for bait sardines (Gabon) and tuna (Angola) lengthened and the time spent steaming correspondingly increased. (Only 2 vessels were able to get bait off the Angolan coast.)

This caused the tuna fishing fleet to move northward. In November and December only a few vessels stayed in the region where they could more easily get bait (in November 23.5 percent of the total time at sea was spent bait fishing, and, in December, only 15.9 percent). The difficulties in getting bait seem to limit the development of the fishery and to inhibit the

establishment of continuous exploitation throughout the year. Scarcity of tuna in October cannot be blamed, as we have previously mentioned, for the departure of the fleet during that month.

**FISHING AREAS:** We have noted 86 bait-fishing areas, which are distributed in the following manner:

Area Description	No. of Times Bait Fishing was Carried On	Season
Ghana - Accra	1	
Annobon	2 (for anchovies)	
Gabon - 0°30' N. - 0°30' S. - Libreville	15	Throughout the year
0°30' S. - 1°30' S. - Cape Lopez	4	
1°30' S. - 2°30' S. - St. Catherine	47	
2°30' S. - 3°30' S. - Nyanga-Mayumba	11	
Congo - 3°30' S. - 4°30' S. - Bas Kouilou	2	August - September - October
4°30' S. - 5°30' S. - Point Noire	2	
Angola - 7°00' S. - 8°00' S. - Ambrizette-Ambriz	2	October - November
Total . . . . .	86	

Practically all the bait came from off the coast of Gabon (Libreville and especially St. Catherine), throughout the year. Considering this restricted distribution of bait, the question might be raised if it would not be preferable to use one or two vessels specially equipped for bait fishing, and much less expensive to operate than tuna vessels. The bait would be kept in live-wells at some point on the coast (Port Gentil, for example) where the tuna vessels could load up without losing time. Taking 3.2 tons of bait as the average needed per trip (105 tons recorded for 33 trips), the total fishing for tuna in 1964 required 360 tons of bait for 113 trips.

The same extrapolation applied to the time necessary for seeking the bait ( $298 \text{ days} \times \frac{113}{70}$ ) gives an estimate of 480 days (20 percent of the total time at sea). These figures demonstrate that it would be beneficial to improve the operation of the bait fishery. However, it is evident that the proposed organization could not be realized unless a tuna fleet operated throughout the year in the region.

**SPECIES FISHED:** The great majority consists of "sardine," or "massoundji" (*Sardinella aurita*) of small size. This is the least common species of *Sardinella* and schools of young individuals are hard to find. The Japanese fishermen want bait of very small size (less than 12 cm.), whereas the French fishermen use individuals up to 20 cm. Supplements of scad (*Trachurus* sp. and *Decapterus* sp.) and mackerel (*Scomber japonicus*) are also used. The vessels fishing around Annobon have sometimes been able to make up their bait from the schools of anchovy (*Enchoviella guineensis*) frequently found around the island.

(b) **Yellowfin Fishery:** The tuna fleet is made up of freezer vessels, with only a few seiners (3 out of 31). We only have information from one seiner trip and have grouped it with the trips of the live-bait vessels for the analysis of the correlation between yellowfin concentration and surface temperature. The differences among the bait boats are not important enough to require grouping those vessels in several classes as to their fishing power.

**CAPTURE PER TRIP AND CAPTURE PER DAY AT SEA:** On the average a trip lasted 20.4 days, during which 60 tons of tuna were captured. If we follow month by month the average length of each trip (table 3), we notice that it does not vary very much; long trips of more than one month are as rare as those of less than 15 days. In general, the vessels came back even if they were not filled up. This explains the parallel between the catch per day and of the average catch per trip (table 3). Those two indices give month by month the overall yield of the fishery. They increase regularly through August and stay high until September. In October and November the yield falls markedly--52.3 and 47.0 tons per trip (2.6 and 2.2 tons per day at sea). We see here the influence of the disappearance of the bait and of the increase in steaming time between the tuna and bait-fishing grounds. As we will see, it can not be concluded that the cause was a decrease in availability of tuna.

**CATCH OF TUNA PER ACTUAL FISHING DAY:** The monthly figures in the last column of table 3, as well as the time devoted to fishing, must be qualified somewhat, because some logs were only filled in partially and in generalities. But we note:

(1) The well known influence of the concentration of the vessels gives a double advantage: scouting for concentrations of tuna and for zones where the yield is better is faster (combing effect); and it is possible to keep in contact with the schools, even though certain vessels have to leave the fishing grounds to unload or to catch more bait.

This fishing in a group is really not very well executed, however, because the fishermen are paid on the basis of their boat's catch, and this makes for a keen spirit of competition among the vessels; some of them show a certain reluctance to going out alone scouting. From June to September, with the progressive increase in the number of vessels, the catch per day actually spent fishing for tuna increased regularly. It fell off again in November and December when only a few vessels remained in the region.

(2) The probable disadvantageous localization of scouting in the cold season. The particularly low catches at the beginning of the year may be explained by the fact that scouting and fishing are carried out in warm water where the tuna are unlikely to be found in large concentrations (as we will see a little later).

It would seem that in November this phenomenon may equally explain the low yield (4.4 tons per day of actual tuna fishing). Apparently the fleet did not follow the movement of the large concentrations of tuna towards the South. On reaching the "black" water of the Congo, where the tuna do not come to the surface, the fishermen stopped; only two vessels crossed the "black" water and found to the south of it some regions of strong concentrations.

#### IV. INFLUENCE OF OCEANOGRAPHIC CONDITIONS ON THE SHIFTING OF THE FISHING GROUNDS

For the last ten years, scientists of the Point Noire Center have been especially interested in the movement of the concentrations of yellowfin and have attempted to relate it to oceanographic conditions. Several cruises by the vessel Ombango, carried out by M. Rossignol, have made it possible to form the hypothesis that large concentrations of yellowfin should occur at the limit of the warm water ( $27^{\circ}$  to  $23^{\circ}$  C.). Those cruises have shown that the schools of yellowfin follow the seasonal movement of the boundary between cool and warm water.

The oceanography of the surface of the region is well known. Work done by G. R. Berrit makes it possible to locate the extreme limits of the warm water in space and time with enough precision for the needs of the fishermen. Thanks to this information, it has been possible for several years to tell the fishermen the region where the concentrations of yellowfin probably will occur, and to predict their seasonal movements.

Our work on tuna fishing has furnished more precise information on the hydrologic preferences of the yellowfin. The largest concentrations are found in waters of  $24^{\circ}$ - $25^{\circ}$  C., which characterize the boundary between the warm and cold water.

(a) FRONTAL ZONE (REVIEW OF BASIC INFORMATION): Schematically, the oceanography of the surface of the Gulf of Guinea can be summed up in this manner: a layer of water called "Guinea Water," which is warm (usually  $26^{\circ}$  to  $30^{\circ}$  C.) and of low salinity (less than  $34\text{ ‰}$ ) lies over the "Benguela Water," which is cooler (temperature less than  $24^{\circ}$  C.) and of higher salinity (more than  $35\text{ ‰}$ ). In our area, the passage from one water mass to the other is rapid; one finds a gradient of four degrees in a few meters vertically (thermocline) and over a distance of 50 to 100 miles horizontally. We use the name "frontal zone" for the strip of rapid temperature change (an example is shown in fig. 2). The layer of warm Guinea Water, 25 meters thick, is separated from the cooler Benguela Water by a strong thermal gradient.



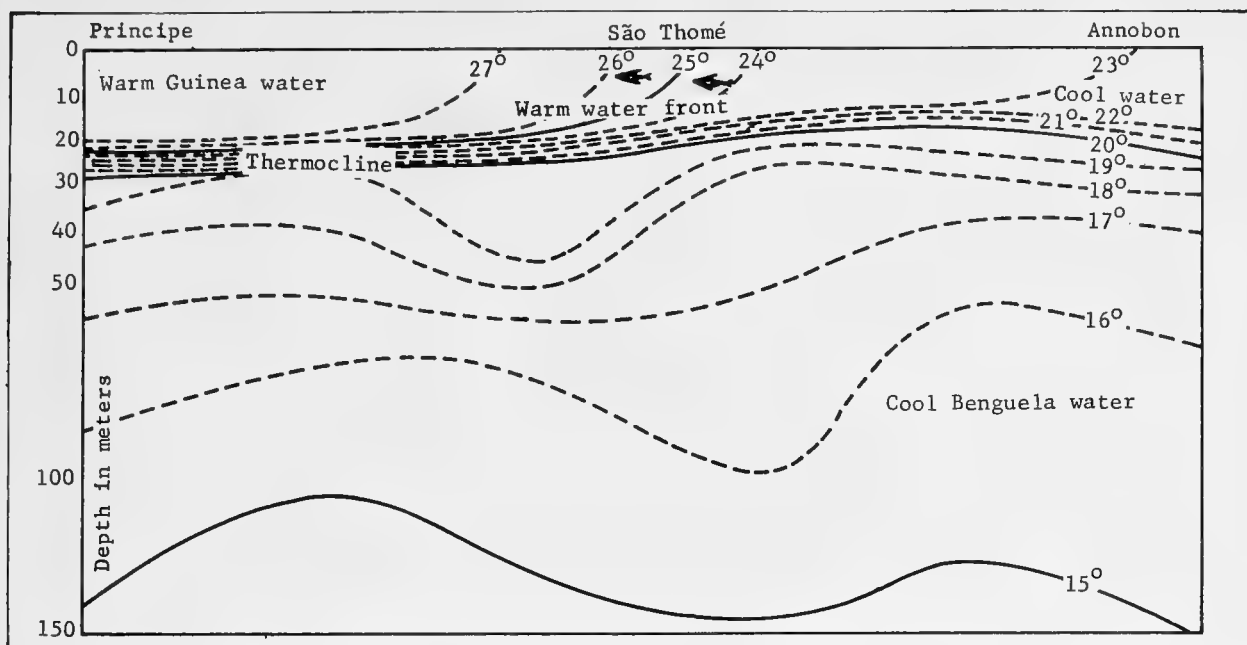


Fig. 2 - Example of the Front: Temperature section from Principe to Annobon in the cold season (May-June 1956), as per G. R. Berit.

Close to our coast, the frontal zone is distinct. It appears to become less distinct as one goes offshore. In the eastern part of the Gulf of Guinea, the thermocline does not go below a depth of 30 to 35 meters. Towards the west it deepens progressively, reaching 100 to 150 meters near the coasts of the Americas.

In the greater part of the region studied, the temperature changes are accompanied by salinity variations. But in the warm season (November-April), even though the warm water front reaches and passes Loanda in its descent towards the south, one does not pass directly from warm water of low salinity (Guinea Water) to cool saline water (Benguela Water). The salinity gradient is fixed at the latitude of Loanda, although the temperature gradient goes down as far as the latitude of Mossamedes; in that region there is a layer of warm saline water ("Tropical Water").

**(b) CORRELATION BETWEEN THE ABUNDANCE OF FISH AND THE TEMPERATURE OF THE SURFACE WATER:** Forty-one log sheets show the temperature of the surface water as recorded at the engine intake. Although those temperatures were measured in a crude fashion, the majority of observations show a close correlation between the presence of tuna and the surface temperature. In table 4, we have shown the daily capture of yellowfin as a function of the surface temperature, for all those days when yellowfin were caught. The temperature taken during days when there were no catches are not included in the table.

We may see from table 4:

(1) Little or no fishing in water of temperature below 23° or above 27° C.; only 2 percent of the 206 daily observations exceeded those limits.

(2) The majority (78.6 percent) of the catches and the largest daily yields (or indices of abundance of fish) were obtained in water between 24° and 26° C., characteristic temperatures of the frontal zone.

- (a) Average daily catch in water of 24° to 25° C.: 6.3 tons
- (b) Average daily catch in water of 25° to 26° C.: 7.7 tons
- (c) Average temperature for catches: 24.9° C.

Table 4 - Catch Per Day of Yellowfin as a Function of Surface Temperature

Temperature (°C.)	Relation with Temperature						
	23°-24°	24°-25°	25°-26°	26°-27°	27°-28°	28°-29°	
Tonnage Caught							Average temperature of all catches 24.9°
0-1	1	9	6	1		3	
1-2	6	5	3				
2-3	2	11	10	2			
3-4	2	5	13	1			
4-5	8	10	8	1			
5-6	3	8	6	3	1		
6-7	1	6	5	2			
7-8	2	3	4				
8-9	1	2	5				
9-10	1	1		1			
10-11		3	6				
11-12			2				
12-13		4	2				
13-14		2	1				
14-15		1					
15-16		2	4				
16-17		1					
17-18		1	1				
18-19	1	2					
19-20		1*					
20-30		1 1*	2				
30-40			1				
40-50		1*	2				
> 100			1*				
Total	29	77+3*	81+1*	11	1	3	
Percentage	14.1	38.8	39.8	5.3	0.5	1.5	with seiner
Average catch (tons)	5.0	6.3	7.7	4.8	5.5	1.5	without seiner

\*Observations from one seiner.

This close correlation between the concentration of yellowfin and the temperature (frontal zone) shown here for surface fish might also exist in the depths. The Japanese long-liners, which we have visited, adjust the depth of their long lines to about 35 meters (the depth of the thermocline) while in our region. Their captures are then made up primarily of yellowfin. These observations, however, are much too few to be studied quantitatively.

(c) CHANGES IN THE FISHING AREA--MIGRATIONS: Our investigations were designed over-all to follow (by vessel observations) the changes in the fishing area, and from that to obtain a partial idea of the migrations of yellowfin. The data were grouped by half monthly periods and plotted on a chart of the region, which is divided into statistical squares of 30 minutes on a side. For each fortnight and each square, we summed up: (1) all the daily

catches on each log sheet, and (2) the fishing effort (the total days of scouting and fishing in each square by all of the vessels). An average temperature was established for each square. Although the evaluation of the catches is accurate enough (only small underestimations by the skippers affect it), the evaluation of the fishing effort presents many more difficulties and, for that reason, a lack of precision. The log sheets filled in on a daily basis allow scouting and effective fishing to be identified, whereas, the log sheets filled in on an overall or general basis (so many tons in so many days) underestimate the scouting time. Therefore, our data on effort are underestimated, and it is necessary to consider them as more nearly indices of observation density than as precise measures of fishing effort.

Because the temperatures are not precise and the average observations per square are for 15 days, it is impractical to construct a network of isotherms; however, the average position of the front can be fixed. To indicate this, we have plotted the isotherms of 24° and 25° C. We used the results of oceanographic cruises made by the Center during the same periods in previous years for those two-week periods during which we do not have observations.

The 17 charts 3/ show the following facts:

1. As we have pointed out in the analysis of tuna versus temperature, the largest concentrations of yellowfin were found in the frontal zone.

The two charts for the month of June clearly show the distribution of the fish at the beginning of the cold season. The front was situated between Port Gentil and São Thomé. During the first part of June, one boat went south of Point Noire to Benguela, and saw not a single tuna. The temperatures observed during that trip were always 24° C. or below. By the second half of June, the boats, moving considerably to the north, found tuna on the front.

3/Available as an appendix attached to the reprint of this article.

From June to August (cold season), the front was stabilized perpendicular to the coast between Port Gentil and Libreville. The fishing was carried out in that area, principally off Libreville.

At the end of August, the front was beginning to descend to the south and the vessels followed.

In September-October, the process was accelerating. A tongue of warm water was descending along the coast; it reached the Congo at the end of September.

From November to April (warm season), we only have a few observations on the fishery from the Congo to Mossamedes, where the front was then located. In November and December only two vessels went there; they found yellowfin in large concentrations.



Fig. 3 - Seasonal movement of the front ( $24^{\circ}$  C. isotherm).

known to Pacific fishermen; the Americans call those fish "home guards."

3. Influence of the Congo Waters: We have grouped data relative to the period from 15 September to 31 December on the same chart. This is the period during which the southward moving front crosses the outflow of the Congo. The form and the extent of that outflow have been studied by the Center at Point Noire; its northern limit, in the period of maximum discharge (observations in November-December 1963), narrowly marks the southern limit of the catch of tuna during the same period in 1964. Almost all of the tuna vessels stop there, associating the disappearance of the yellowfin with the appearance of "black" water. Only two live-bait vessels crossed that water; they found the tuna once again when they entered clear water. It seems very probable that the tuna passed underneath the thin layer of "black," low

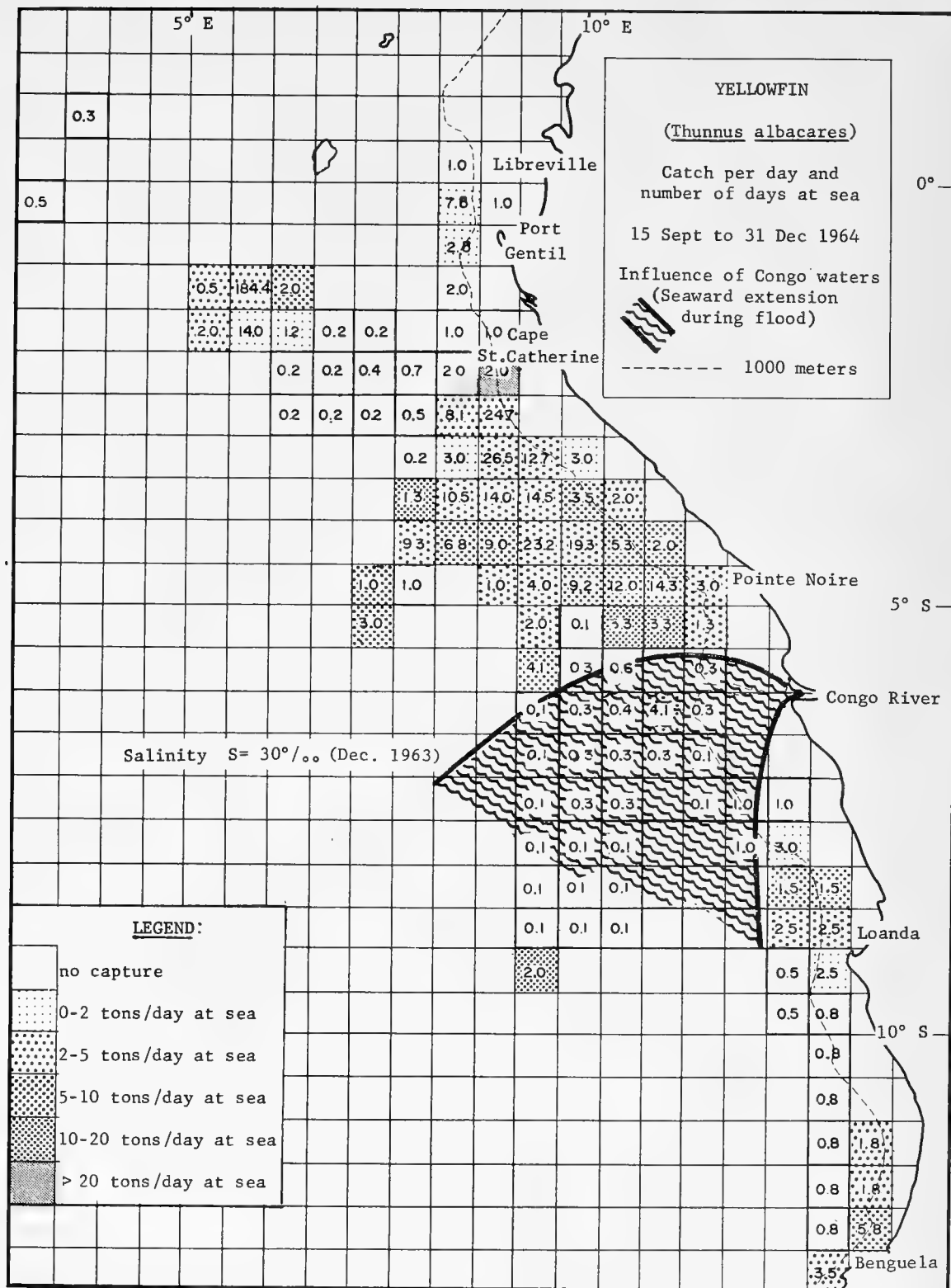
The three charts from January 16 to February 29 demonstrate that the fishery was carried on in very warm water ( $28^{\circ}$  C.), and that the overall yield was poor. From January to April the warm water reached its southernmost position (Mossamedes) and spread out farther and farther from the coast to attain a position perpendicular to it. On the other hand, we know that tuna fishing was carried out at Baia Farta (Benguela) from the end of September to March-April.<sup>4</sup>

We have seen that to the south of Loanda a warm, salty water mass (Tropical Water) extends to the cold-water front. It would be interesting to see if the change in salinity of the waters then inhabited by the yellowfin influence their distribution.

In May there were no observations on yellowfin; the front was rapidly returning to its cool season position (Cape Lopez-Annobon).

2. In the warm season, that is to say when the front moved to the South, the island of Annobon was surrounded by warm water ( $26^{\circ}$ - $28^{\circ}$  C.). Nonetheless, the schools of yellowfin were always seen there and always caught (charts for January and February-November and December). This phenomenon of a permanent concentration around islands is well

<sup>4</sup>/In a personal communication, F. Correia da Costa has furnished us some information on the live-bait fisheries at Baia Farta. This is carried out by small (10 meters) open boats which make one-day trips on the Continental Shelf. The catches are made up of yellowfin, bigeye, and little tuna. Each boat catches from 250 to 300 tons each season.



salinity water. During the second half of November, a French vessel spotted some Japanese long-liners fishing in those waters. Because the layer of "black" water is very thin, it is sometimes possible by chumming to make the tuna come up to the surface and to fish them there by pole-and-line (the fishery around  $6^{\circ}30'$  S. by  $10^{\circ}30'$  E. during the second half of November).

4. Optimum Areas for Tuna Concentrations. Judging from the overall picture on the charts, it appears that the yellowfin school more densely in some select areas: (1) around islands (Annobon in particular); and (2) off the Continental headlands at Libreville, Point St. Catherine, Nyanga, Mayumba, Point Noire, Loanda, Port Ambouin, and Benguela. However, the concentrations are not limited to a narrow band parallel to the coast. The French vessels have operated at a distance of about 160-200 miles offshore, but in January-February 1965, some Japanese live-bait vessels were seen 400 miles southwest of Point Noire, approximately where the  $24^{\circ}$  C. isotherm is located at that time. It remains to be seen if the progressive separation of the  $24^{\circ}$  and  $25^{\circ}$  C. isotherms as one goes offshore has a certain influence on the abundance of the yellowfin. In fact, beyond about 100 miles offshore, the horizontal gradient weakens so much that one can no longer define the limit of the warm waters of the frontal zone.

## V. CONCLUSIONS

This study has permitted us to demonstrate the enormous role played by oceanographic conditions in the geographical distribution and perhaps the bathymetric distribution of the yellowfin in our region. This fish shows a well defined preference for the zones characterized by a strong thermal gradient (the frontal zone and without doubt the thermocline), which separates the Guinea Water and the Tropical Water from the Benguela Water. Four-fifths of the captures made in 1964 by the French live-bait vessels in the eastern tropical Atlantic came from the frontal zone ( $24^{\circ}$  to  $25^{\circ}$  C.). These ecological relationships of the yellowfin are very similar to those demonstrated by studies in the Pacific. In the eastern Atlantic, studies on the ecology, stocks, and dynamics of the yellowfin are quite rare and the lack of them becomes more and more evident. To which physico-chemical or biological and feeding (plankton) characteristics this close correlation is due, it is impossible to say at this point in our studies, for the temperature is only an index of a type of water having a whole series of related properties. Furthermore, the ecological laws which regulate the migration of the yellowfin must vary with their age and physiological state (sexual state). This preliminary study does not permit any analysis of this sort; analysis of the average lengths of the fish captured (when available from the logs) has not given any information in relation to time or location.

However, the overall conclusions we have reached should help the fishermen in their scouting. We are able to show that during certain periods of 1964, the activity of the vessels was carried out outside the probable zone of strong concentration. It may be hoped that this study, based on the vessels' own logs, will help them to better localize their activity.

Continuous temperature observations should become a general rule. Using a recording thermometer (such as exists on certain boats), location of the frontal zone is easy in conjunction with the charts of the probable monthly position of the  $24^{\circ}$  C. isotherm. Zones of rapid temperature change should be scouted.

For several vessels, 1964 was the year of first contact with our region. In spite of imperfect knowledge of the yellowfin and difficulties in capturing bait, the results are encouraging. The catches per day at sea have been comparable with those of the California fishermen on the Pacific coast of America between California and Peru (R. C. Hennemuth 1961).

## VI. APPENDIX

The 17 charts mentioned in the article are available as an appendix attached to the reprint of this article. Write for Separate No. 739. There is a chart for each 15-day period showing catch of yellowfin per day and number of days at sea. Covered are the months of January, February, June, July, August, September, October, November, and December 1964.

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## READER'S COMMENT

The staff of Commercial Fisheries Review was pleased to read the recent remarks of a Spanish subscriber. In a letter of June 1, 1965, to the Madrid daily newspaper Ya, Gaspar Massó, a member of a Vigo firm said, in part (translated from Spanish):

"...Others may forget the manifold assistance given them for their development, but even though it may not seem of importance to you there are many industrial concerns who are grateful for the . . . instructive and statistical data of exceptional interest. We mention, as an example, the fine work of the Department of the Interior of United States, which through the Bureau of Commercial Fisheries of the Fish and Wildlife Service, distributes . . . its authoritative publication Commercial Fisheries Review with 120-150 pages of excellent text, further supplemented with statistical data by the Market News Service.

"We do not refer precisely to the . . . cost of this publication issued by the aforementioned official agency, but to the incalculable benefits which mean so much to us to have at our disposal such useful material, received by mail with mathematical regularity. . . ."



Created in 1849, the Department of the Interior--a department of conservation--is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States--now and in the future.



# TRENDS AND DEVELOPMENTS

## Fishing Vessel and Gear Developments

### EQUIPMENT NOTE NO. 17-- LONG-LINE GEAR IMPROVEMENT - ALUMINUM CRIMPING SLEEVE PREVENTS HOOK DAMAGE BY ELECTROLYSIS:

Extensive hook deterioration and loss caused by electrolysis has plagued swordfish fishing efforts in the new Atlantic Ocean long-line fishery off the east coast of the United States. Copper and zinc-plated copper crimping sleeves have been used to secure hooks to leaders of stainless steel or galvanized wire cable. Contact of the dissimilar metals--zinc, copper and steel--in an electrolyte (sea water) forms a galvanic cell (battery) which produces an electric current. This current electrolyzes (dissolves or corrodes) the eye of the hooks (figure). On one occasion long-line gear with many new hooks was lost and retrieved four days later. Most of the hooks had become badly corroded with the eyes nearly destroyed. Hooks, weakened in this way, frequently result in the loss of hooked fish.

These observations indicated a leader and hook assembly should incorporate a crimping sleeve of a more active metal than copper in order to eliminate electrolytic damage to the hook. An aluminum alloy sleeve was tested by an American fisherman during 1963. After 9 months and 76 long-line sets the test hooks showed only slight deterioration. Only the aluminum sleeves were badly corroded and required replacement. The previous assembly, using a copper sleeve, required hook replacement after about 30 long-line sets.

The substitution of aluminum for copper as a sleeve material has minimized hook deterioration and fish loss, and reduced assembly costs since the cost of aluminum sleeves is approximately 25 percent less than that of copper.

--By Peter C. Wilson, Fishery Biologist (General),  
Exploratory Fishing Base,  
U. S. Bureau of Commercial Fisheries,  
Gloucester, Mass.



The hook on the right is secured to the stainless steel leader with a copper sleeve. Note that the hook has deteriorated from electrolysis. The hook on the left is secured with an aluminum sleeve. Both hooks were used the same length of time in salt water (approximately six weeks).

U. S. DEPARTMENT OF THE INTERIOR  
Fish and Wildlife Service  
Sep. No. 740

## Alaska

### FOREIGN FISHING ACTIVITY OFF ALASKA, MAY 1965:

U.S.S.R.: The central Gulf of Alaska became the scene of major Soviet trawling efforts during May 1965. More than 100 Soviet trawlers, 20 reefers, and various support vessels were dispersed generally along the 100-fathom curve from Cape Spencer north and west to Portlock Bank east of Kodiak by the end of the month. A small trawling fleet of about 10 trawlers and 2 reefers continued to fish the area southwest of Cape Ommaney off southeast Alaska, which was heavily worked earlier this year.



Fig. 1 - SRT-R trawler off-loading Pacific ocean perch to a Soviet reefer vessel.

In the western Gulf of Alaska the trawling fleet operating east of the Shumagin Islands was also reduced. Many of the BMRT factory trawlers shifted to the western Aleutians area, leaving a fleet estimated to contain about 12 trawlers, with several reefers and support vessels. The Soviet trawling fleets in the Gulf of Alaska during May appeared to be catching Pacific ocean perch almost entirely.



Fig. 2 - Soviet king crab factoryship.

At least 4 Soviet SRT-M trawlers were fishing for shrimp in the Gulf of Alaska during the month. Most of their fishing was in the Kodiak area until early May when the SRT-M's shifted to the area east of the Shumagin Islands. Observations were that their catches of shrimp were substantial in that region. Three of the SRT-M trawlers, previously associated with shrimp fishing, were seen working among the ocean perch fleets in the central Gulf.

A sizable Soviet trawling fleet developed in the western Aleutians in the general vicinity of Attu Island. About 20 trawlers, including about 10 BMRT factory trawlers, were engaged in the Pacific ocean perch fishery there, which Soviet sources have reported highly successful.

The 3 Soviet king crab factoryships, accompanied by about 9 tangle-net handling SRT trawlers, operated in outer Bristol Bay about 80 miles northwest of Port Moller throughout May.

Soviet whale killer vessels believed to be assigned to the factoryship Aleut were sighted about mid-month near Atka Island in the central Aleutians. Additional whaling fleets were expected, for in past years the Soviets have operated 3 or 4 such fleets off Alaska.

Early in May the Soviet refrigerated fish transport Churkin was granted permission to enter the harbor at Kodiak to deliver a crew member requiring emergency medical treatment. The U. S. boarding party reported the Churkin was equipped to receive fresh fish as well as frozen blocks of fish. The master of the vessel said they were not taking salmon but only small fish and indicated an ocean perch size fish with his hands.

Japan: Three Japanese factoryships were engaged in fish meal and oil production off Alaska during May. The vessels Gyokuei Maru (accompanied by 26 trawlers), Hoyo Maru (with 29 trawlers), and Tenyo Maru (with 10 trawlers) operated in outer Bristol Bay about 80 miles north of Unimak Pass. In addition to meal and oil production, the Tenyo Maru fleet reportedly would fish primarily for Alaska pollock for conversion into minced fish meat (used as an ingredient for fish cakes and fish sausage).

The Japanese shrimp factoryship Einen Maru, with 15 trawlers, remained during May on the proven shrimp fishing grounds about 60

miles northwest of the Pribilof Islands. The second Japanese factoryship (Chichibu Maru) reportedly licensed for shrimp fishing was boarded by a United States party north of the Pribilofs. The Japanese said their main objective this year would be freezing Pacific ocean perch and flatfish. That vessel still has 6 shrimp-peeling machines installed aboard. About mid-month the Chichibu Maru and her 12 trawlers moved to the western Aleutians north of the Rat Islands and were observed fishing perch.



Fig. 3 - Gyokuei Maru, Japanese fish meal factoryship.

King crab fishing by the Japanese factoryships Tokei Maru and Tainichi Maru and 10 tangle-net handling trawlers was concentrated in outer Bristol Bay about 80 miles northwest of Port Moller. The Japanese king crab fleets have often been sighted working the same grounds as their Soviet counterparts.



Fig. 4 - Japanese shrimp factoryship Einen Maru.

At least 4 factory stern trawlers and about 4 smaller side trawlers were believed to be fishing in the western Aleutians area primarily for Pacific ocean perch during May. In the area between Unimak Pass and the Pribilof Islands, 2 other Japanese factory trawlers were operating.

In the Gulf of Alaska, the Japanese factory stern trawler Taiyo Maru No. 82 fished mainly on Portlock Bank east of Kodiak Island, the Daishin Maru No. 12 alternated between Portlock Bank and Albatross Bank off southwest Kodiak, and the Akebono Maru No. 53 worked



Fig. 5 - Japanese crab factoryship Tokei Maru.

between Chirikof Island and the Shumagin Islands southwest of Kodiak.

Long-line fishing by the Japanese continued at a low level during May, with only one small fleet operating off Alaska. That fleet, composed of the fishing-processing vessel Kotoshiro Maru, accompanied by 3 long-liners, was last reported fishing near Semisopochnoi Island in the western Aleutians. So far in 1965,



Fig. 6 - Processing crab meat aboard a Japanese factoryship.

6 Japanese vessels were sighted fishing long lines in the Gulf of Alaska which, as far as is known, are not licensed by the Japanese Fishery Agency to operate in the Gulf area. It is believed those vessels were operating independently rather than belonging to a fleet. Detailed observations of those vessels and U. S. boardings of two of them showed they were taking mainly sablefish. No salmon or halibut were observed aboard the long-liners.

\* \* \* \* \*

#### FISHING INDUSTRY MODERNIZATION CONFERENCE PLANNED:

A fishing industry modernization conference to be held in Alaska during summer 1965 has been planned by Alaska's Governor Egan. The prime objective will be to pinpoint areas of needed change and plan pilot projects to

demonstrate new techniques in harvesting and marketing fishery products. The general plan for the conference includes a two-week tour--beginning in late July--of Alaska fishery-producing areas by a special task force of consultants. The task force will include W. S. Miller, an economic development consultant on Governor Egan's staff; the quality control manager for Safeway stores; Dr. Georg Borgstrom, food scientist from Michigan State University; a food-processing engineer from Portland, Oreg., and a representative from the National Cannery Association. Two members of the U.S. Bureau of Commercial Fisheries will serve as technical advisors to the conference. Personnel from the Bureau's regional office at Juneau will accompany the task force throughout the tour and also join the group for the final conference in Anchorage.

\* \* \* \* \*

#### NEW FLOATING SHRIMP CANNERY:

The vessel Pacific Pearl, converted from the former 175-foot Coast Guard buoy tender Hemlock, left Seattle under tow the latter part of May to operate as a floating shrimp cannery in Kodiak, and replace one lost at Seldovia in the March 1964 earthquake. According to a spokesman for the owners, this is the first vessel of her kind in Alaska.

Engineroom machinery and other gear were removed from the vessel so as to provide maximum working space. It will be able to handle 500 cases (24 cans each) of shrimp an eight-hour shift, and employ 30 to 40 at peak periods. Operations were to shift to king crab in mid-summer. The cost of the conversion was reported to be \$350,000.

\* \* \* \* \*

#### YUKON RIVER SALMON SMOLT OUTMIGRATION CHRONOLOGY STUDY:

The Branch of River Basin Studies, U. S. Bureau of Sport Fisheries and Wildlife, completed its first month of salmon smolt outmigration sampling in the Yukon River for the 1965 season. Fyke nets, scoop traps, minnow traps, and a tow net took whitefish, burbot, lamprey, and suckers, but no salmon were caught until May 26 when the first chum salmon smolt appeared. The work was conducted in open leads in the river and in open water prior to and during the breakup period.

\* \* \* \* \*

#### RED SALMON WORKSHOP HELD:

Fishery scientists from California to Alaska attended the interagency red salmon workshop held for 3 days in Juneau under the sponsorship of the Auke Bay Biological Laboratory, U. S. Bureau of Commercial Fisheries. The workshop brought the scientists up-to-date and defined the current status of red salmon research and problems. Discussions covered all aspects of the red salmon life cycle and included such subjects as basic ecology, physiology, manipulation of the environment, cyclic phenomena, distributions of stocks, and prediction of abundance. Agencies represented at the workshop were the U. S. Bureau of Commercial Fisheries, U. S. Bureau of Sport Fisheries and Wildlife, Alaska Department of Fish and Game, Fisheries Research Institute of the University of Washington, Fisheries Research Board of Canada, Canadian Department of Fisheries, and the International Pacific Salmon Fisheries Commission.

\* \* \* \* \*

#### JAPANESE GROUND FISH CATCHES IN GULF OF ALASKA:

An observer from the Bureau's Auke Bay Biological Laboratory returned to his station after nearly a month's work aboard the Japanese stern trawler Takachiko Maru in the Gulf of Alaska. Principal areas fished by the vessel were Unalaska (248,844 pounds of fish taken) and the Shumagins (30,847 pounds of fish taken). Of 253 hauls, all but 3 were for groundfish. Groundfish hauls averaged about 5.3 metric tons, with the bulk of the catch Pacific ocean perch and sablefish. Another observer completed monitoring of the stern trawler Daishin Maru No. 12 and was scheduled to return to Auke Bay in early June.

\* \* \* \* \*

#### KODIAK CRAB TAG RETURNS:

Tag returns from king crabs in the Kodiak Island area were less numerous during May 1965 than during prior months (23 tag returns during May compared to 267 in April). This was expected because fishing intensity decreases during the molting and spawning periods of king crab. Fishing intensity was expected to remain at a low level until about mid-July.

\* \* \* \* \*

AUKE BAY PINK SHRIMP GROWTH RATE:

Pot fishing for shrimp in Auke Bay was continued through May 1965. Samples showed that Auke Bay pink shrimp (Pandalus borealis) reach a carapace length of 8 to 9 millimeters (0.32 to 0.35 inches) at one year, and 13.5 to 14.5 millimeters (about 0.51 to 0.55 inches) at two years. This early growth rate is comparable with that in lower Kachemak Bay.

\* \* \* \* \*

NEW PESTICIDES PROGRAM STARTED:

A new pesticides monitoring program was begun in May 1965 as part of the U. S. Bureau of Commercial Fisheries' nationwide program coordinated through the Gulf Breeze Laboratory. Plans were completed for collecting fish from representative areas throughout Alaska. Initially, fish are to be tested for DDT contamination by the Wisconsin Alumni Research Foundation. Later, the Gulf Breeze Laboratory may do the analyses.

Plans were made for cooperative field and laboratory studies by the Bureau's Auke Bay Biological Laboratory and Northern Forest Experiment Station of the U. S. Forest Service to develop biological forest pest controls which are harmless to fish and shellfish. Effects of feeding by juvenile coho salmon and small king crab on spruce budworm larvae infected with Bacillus thuringiensis will be determined in the laboratory.

\* \* \* \* \*

SOVIET FACTORYSHIP OFF ALASKA VIOLATES U. S.-SOVIET FISHING AGREEMENT:

The U. S. Coast Guard announced in a June 24, 1965, press release that one of its vessels on patrol off the Alaskan shore recently discovered Soviet fishing vessels taking king crabs in violation of an agreement signed by the United States and the Soviet Union this year.

The Coast Guard said that its cutter Storis, on patrol off Alaska June 21, saw the Soviet factoryship Konstantin Sukhanov, with 7 fishing boats in the water, taking king crab from 40 fathoms approximately 25 miles south of Unimak Island, Alaska. This is outside the area agreed upon for Soviet king crab fishing in an agreement signed February 5, 1965. The agreement provides for Soviet king crab fishing on the Continental Shelf of the United States in the part of the eastern Bering Sea

west of 160° West Longitude. A protest based on the report of the Coast Guard cutter Storis was made on June 24 by the Department of State to the Soviet Embassy in Washington, D. C.

The report of the cutter Storis said that its preliminary attempts to make radio contact with the Soviet factoryship were unsuccessful. Late in the afternoon of June 22 the Konstantin Sukhanov picked up all her catcher boats and proceeded into the Bering Sea through Unimak Pass. The Storis using international signals advised the Soviet vessel that fishing for king crab was only permitted in the eastern Bering Sea. The Konstantin Sukhanov using international signals replied, "fishing for king crabs proceeding in eastern Bering Sea." (U. S. Coast Guard press release, Washington, D. C., June 24, 1965.)

\* \* \* \* \*

PLANS FOR JOINT JAPANESE-UNITED STATES FIRM TO PROCESS FISH IN ALASKA:

On May 20, 1965, the Governor of Alaska announced that preliminary negotiations had been completed for the joint operation of a fish-processing plant on Prince William Sound by Japanese-United States interests, beginning in the fall of 1965. Involved are a United States fishery firm with headquarters in Seattle, Wash., and two large Japanese firms.

The Governor of Alaska hailed the plan as "a most important milestone in Alaska's economic growth." But he pointed out, "It should be clearly understood that this venture does not mean any lessening of our desire to stop the Japanese from catching our North American salmon on the high seas."

Plans for the joint company were summarized in the Japanese periodical Nihon Keizai on May 22, 1965, as follows:

The joint firm will operate an existing cannery at Orca on Prince William Sound. The Orca cannery is said to have the capacity to produce 200,000 standard cases of salmon during the summer fishing season. The joint company would market its canned salmon pack in the United States, while shipping salmon eggs to Japan. The company might also ship to Japan frozen chum salmon. That species is in demand on the Japanese salt-fish market. In addition, the com-

pany might expand the Orca operation to process crab, herring, and other fishery products. Export sales to Europe have also been mentioned.

The periodical Nihon Keizai in addition reported that, entirely separate from the group involved at Orca, another large Japanese fishing company was working on plans to enter the Alaska canned salmon industry. (United States Embassy, Tokyo, May 27, 1965.)



## Alaska Fisheries Explorations and Gear Development

### LARGE ROCKFISH POTENTIAL SEEN OFF SOUTHEAST ALASKA:

More than 23,000 pounds of rockfish were brought up in a single 1-hour tow during explorations off southeast Alaska in May 1965 by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John R. Manning. The 86-foot vessel was making a survey of trawlable grounds and abundance of bottom-fish resources about 30 miles off Prince of Wales Island.

The large rockfish catch was made with a standard commercial-type otter trawl commonly used by West Coast fishermen, but the size of the catch was comparable to the hauls made by the large foreign vessels operating off Alaska's coast.

The entire catch was used for animal feeding experiments by the U. S. Department of Agriculture's experimental fur farm at Petersburg, Alaska. About 90 percent was black rockfish with the remainder mostly Pacific ocean perch and widow rockfish.



## American Fisheries Advisory Committee

### INTERIOR SECRETARY APPOINTS TWO NEW MEMBERS TO FILL VACANCIES:

The appointment of W. O. Smith, Ketchikan, Alaska, and Clifton D. Day, San Francisco, Calif., to the American Fisheries Advisory Committee, was announced on June 22, 1965, by Secretary of the Interior Stewart L. Udall. The Committee, established in 1955 under

provisions of the Saltonstall-Kennedy Act, advises the Secretary of the Interior on general commercial fisheries matters. It is composed of 20 key fishing industry representatives from various sections of the Nation.

Smith has lived in Alaska since the early 1930's, and in Ketchikan since the mid-1940's, where he has been a high-line commercial salmon troller and has represented the salmon trollers in union matters. He was elected to the Alaska Constitutional Convention and served two terms as State Senator from 1959-1965. He replaces Chris Dahl, Petersburg, Alaska, who retired from the Committee after serving since 1955.

Day has been in the fish-canning business for 29 years, and in 1960 was elected Vice President of Alaska Packers Association. He was an advisor to the United States delegation at the second Japan-United States Tuna Conference in Tokyo in 1962, is an advisor to the Pacific Marine Fisheries Commission, and a member of the Fishery Products Committee of the National Cannery Association. He replaces Arthur H. Mendonca, also of San Francisco, who retired from the Committee after serving since 1955.



## American Samoa

### REJECTIONS OF BIG-EYED TUNA DELIVERIES REPORTED HIGH:

Big-eyed tuna deliveries to American Samoa were being rejected at a very high rate in months preceding June 1965, according to the report filed by the Japan Export Trade Promotion Organization's (JETRO) fishery representative in Samoa. In April, one United States packer on that island rejected, in a number of instances, over 50 percent of the quantity processed for packing, and in one instance 100 percent of the processed quantity. The JETRO report attributes this high rate of rejection to stricter inspection standards adopted by the U. S. packing firm. (Suisan Keizai Shimbun, June 3, 1965.)





## Blue Crabs

### SEMIAUTOMATIC CLEANER-DEBACKER MACHINE DEMONSTRATED:

The operation of a semiautomatic machine for cleaning and debacking blue crabs was demonstrated at Alexandria, Va., in May 1965. It was a special demonstration attended by several members of the House of Representatives Merchant Marine and Fisheries Committee who are from the crab-producing States of Maryland and Virginia.



Operation of new crab cleaning machine being observed by members of the House of Representatives Merchant Marine and Fisheries Committee. Also present are Donald L. McKernan, Director, U.S. Bureau of Commercial Fisheries, and an official of the firm that developed the machine.

The machine, developed under a contract between the Department of the Interior's Bureau of Commercial Fisheries and the American Scientific Corporation, Alexandria, punches through the shell of precooked crabs, exposing a core containing the lump and flake meat. The crab meat is then easily removed from the shell and cartilage. Preliminary tests indicate that the machine eliminates a number of hand-operation steps. It is the first of 4 machines which the Bureau hopes will enable the United States shellfish industry to offset rising labor costs and the loss of skilled labor.

Blue crabs produced along the East and Gulf Coasts now are debacked and cleaned entirely by hand. Development of the new machine is a major breakthrough for the crab industry.

Note: See Commercial Fisheries Review, May 1965 p. 12.



## California

### PELAGIC FISH POPULATION SURVEY CONTINUED:

M/V "Alaska" Cruise 65-A-3-Pelagic Fish (April 19-May 3, 1965): To make an echosounder survey of the pelagic species, particularly northern anchovies (*Angraulis mordax*), Pacific sardines (*Sardinops caeruleus*), Pacific mackerel (*Scomber diego*), and jack mackerel (*Trachurus symmetricus*) was the objective of this cruise by the California Department of Fish and Game research vessel Alaska. The area of investigations was in the waters of southern California from San Diego to Gaviota, extending offshore to Cortes Bank.

This was an experimental cruise to explore a new method of surveying pelagic fish populations. The results obtained with anchovies show this type of survey has excellent possibilities for more comprehensively measuring anchovy density and distribution.

A Precision Depth Recorder (Westrex Mark XV) was operated while the vessel traversed a series of predetermined routes crossing the survey area. The vessel track was plotted every hour and schools detected were recorded on the track. In some areas the same pattern was traversed during both day and night. Schools appearing on the echosounder were sampled with a midwater trawl. A Furuno Net-Sonde (Model FNZ-5) wireless depth telemeter was operated with the trawl to obtain fish school depths.

A total of 1,306 miles was traversed on this cruise, and 1,880 schools were detected. Daytime operation accounted for 834 miles and 1,658 schools, while 472 miles and 222 schools were logged at night. The low number of schools recorded at night resulted because the fish scatter and rise to the surface after dark. The resulting echo traces consisted of light scatter with few defined schools.

Northern anchovies accounted for nearly all the fish detected. They were distributed in small schools over a large area of clear blue water south of the northern Channel Islands, and were found almost everywhere in that area out to the offshore limits of the survey (85 miles). Heaviest concentrations were found between San Clemente Island and San Diego, and in the Santa Cruz Basin and Outer Santa Barbara Passage.

Up to 70 schools an hour were detected at a vessel speed of 10 knots. North of the northern Channel Islands and inshore of 50 fathoms, very few schools were present. The Santa Barbara-Port Hueneme area, which is usually the richest in anchovies, was almost completely devoid of fish.

Although it was not possible to measure anchovy school size accurately, the schools were obviously quite small. Visual observation of daytime breezing schools indicated amounts probably not exceeding 1 ton per school. Midwater trawl catches rarely exceeded 100 pounds and echo-sounder traces were much smaller than those recorded on other cruises.

All evidence indicated that the anchovy population was spawning and that the distribution and schooling behavior noted on this cruise are typical during the spawning season. Almost all fish examined were in advanced stages of maturity. Night catches contained numerous running-ripe females which appeared to have been spawning at the time they were caught. In samples which contained spawning fish, 70 to 92 percent of the individuals were males and the smallest ripe female was 113 millimeters (4.4 inches) long. Most fish sampled were adults ranging from 91-165 millimeters (3.6 to 6.5 inches) standard length with a mean of 122 millimeters (4.8 inches). Only 3 percent were smaller than 100 millimeters (3.9 inches).

The schools were distributed between the surface and 40 fathoms, with a great many 10 to 15 fathoms down. Midwater trawl catches consisted primarily of anchovies with occasional individuals of other species, including Pacific hake (*Merluccius productus*), jack mackerel, lanternfish (family *Myctophidae*), and squid.

Several night tows were made in one area to check on variability between tows. Those trawls yielded catches of anchovies which varied only slightly in quantity indicating the trawl is fairly reliable for measuring abundance on at least a relative basis.

During the cruise, one gill-net set was made at night in the open sea where anchovies were present. Despite very bad weather, 2 fish were taken. Night light stations in a small area on successive nights produced contrasting results. The first night's work under calm sea conditions was very successful in attracting anchovies. The following

night, with a brisk wind and choppy sea prevailing, no fish were attracted.

Sea surface temperatures of 59°-63° F. (15.0°-17.2° C.) prevailed in the survey area. Generally calm weather permitted completion of work scheduled for this cruise.

Note: See Commercial Fisheries Review, July 1965 p. 18.

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Airplane Spotting Flight 65-5-Pelagic Fish (May 13-14, 1965): To determine the inshore distribution and abundance of pelagic fish schools, the inshore area from Santa Cruz to the United States-Mexican Border was surveyed from the air by the California Department of Fish and Game's aircraft Cessna "182" N9042T.

On May 13, the first day of the survey, the area from Ventura to the United States-Mexican Border was scouted. The weather was generally poor, with a low cloud cover which severely hampered fish school spotting. Despite the poor visibility, many schools of northern anchovies (*Engraulis mordax*) were sighted. The largest schools were seen in the San Diego area.

The area from Santa Cruz Point to Santa Monica was scouted the following day. Scouting conditions were good in the immediate inshore waters, but offshore (beyond about 1 mile) a strong wind roiled the surface and fish spotting was not very successful. Anchovy schools were seen at Cayucos and from Coal Oil Point to Santa Monica. They were small schools and often within the surf line. Red tide was noted that day at Lopez Point, in Santa Monica Bay, and the Huntington Beach and San Diego areas.

Note: See Commercial Fisheries Review, April 1965 p. 16.

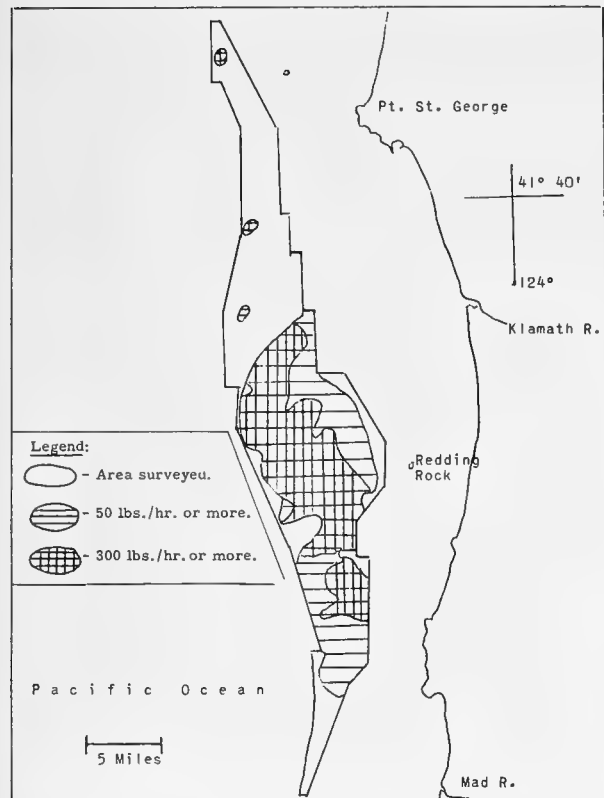
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#### SURVEY OF SHRIMP RESOURCES IN COASTAL WATERS CONTINUED:

M/V "N. B. Scofield" Cruise 65-S-1-Shrimp (March 10-April 23, 1965): The objectives of this cruise by the California Department of Fish and Game research vessel N. B. Scofield in coastal waters from the Oregon border to Eureka, Calif., were to: (1) sample randomly concentrations of ocean shrimp (*Pandalus jordani*) for determining population estimates and natural mortality rates; (2) determine size, sex, and weight of shrimp; (3) collect stomachs from Pacific hake (*Merluccius productus*) and arrowtooth

halibut (*Atheresthes stomias*), and examine them for juvenile shrimp; (4) collect gravid female shrimp for rearing at Menlo Park laboratory; (5) collect cephalopods, rare fish, and invertebrates for special collections and the State Fisheries Laboratory, Terminal Island.

Four tows were made off Bodega Bay in an attempt to catch gravid females for development studies. Not enough egg-bearing females were caught there so about 80 of them were collected off Crescent City and transported to the State's Menlo Park Laboratory by plane.



M/V N. B. Scofield Cruise 65-5-1-Shrimp (March 10-April 25, 1965.)

In all, a total of 127 ten-minute tows were made in an area of 278 square miles from the Oregon border to Mad River, Calif. Towing areas were preselected in accordance with a stratified random sampling program designed by the Biostatistics Section, California Department of Fish and Game. The gear used was a semiballoon, Gulf of Mexico shrimp trawl with 41-foot headrope and 1-inch stretched mesh. A  $\frac{1}{2}$ -inch stretched-mesh liner was used in the cod end to prevent small 1-year-old shrimp from escaping. Fishing depths during the cruise ranged from 30 to 100 fathoms.

During the cruise it was found that the shrimp bed in one of the areas worked (Area A) where 50 pounds or more an hour could be taken involved some 152 square miles, and contained an estimated 4 million pounds of shrimp. Commercial concentrations, yielding 300 pounds or more an hour, were found over an area of about 88 square miles. The average catch per hour on this cruise was 366 pounds and ranged from 36 to 1,380 pounds.

The count of shrimp (heads on) per pound ranged from 54 to 262, with a mean of 183. About 28 percent of the females caught were carrying eggs. A few gravid 1-year-old females were observed.

In most cases, fish catches on this cruise were small, with several tows yielding large concentrations of whitebait (*Allosmerous elongatus*).

A few unusual cephalopods collected on the cruise were sent to the California State Fisheries Laboratory for identification. A total of 101 Pacific hake and arrowtooth halibut stomachs was collected and preserved for examination in the laboratory. Also, several species of flatfish were collected by personnel from the University of California's Institute of Marine Resources for pesticide residue studies.

Note: See *Commercial Fisheries Review*, April 1965 p. 17.

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#### MARINE SPORT FISH SURVEY OFF SOUTHERN CALIFORNIA:

Airplane Survey Flight 65-4 (April 23, 1965): This one-day survey was the first of a series of flights to count the number of poles being fished from the shoreline by sport fishermen, and also count the number of persons attending them, if possible. For this purpose, the southern California coastline between Jalama Beach and the Mexican Border was surveyed from the air by the aircraft Cessna "182" N9042T of the California Department of Fish and Game. The counts made will eventually be used to determine shore-fishing effort in southern California.

The weather was clear and visibility was good throughout the flight. The shoreline between Los Angeles harbor and Jalama Beach was covered earlier in the day. In the afternoon the coastline between Long Beach and the United States-Mexican Boundary was surveyed. The result of the survey was a

count of 64 fishing poles attended by some 54 persons.



## Cans--Shipments for Fishery

### Products, January-March 1965

A total of 592,020 base boxes of steel and aluminum was consumed to make cans shipped to fish and shellfish canning plants in January-March 1965 as compared with 571,307 base boxes used during the same period in 1964.



Larger shipments to the Pacific area accounted for the increase in 1965. The gain was partly offset by lower shipments to the East and South. Following are regional shipments in the first quarter of 1965 and 1964 (reported in base boxes of steel consumed to make cans):

Receiving Area	Jan.-Mar.	
	1965	1964
West. . . . .	414,000	360,000
East . . . . .	161,000	187,000
Southern. . . . .	17,000	24,000
North Central . . . . .	1/	1/
1/Less than 500.		

Note: Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14" x 20" size. Ton-age figures for steel (tinplate) cans are derived by use of the factor 23.7 base boxes per short ton of steel.



## Central Pacific Fisheries Investigations

### SKIPJACK TUNA

#### BIOLOGICAL STUDIES CONTINUED:

M/V "Charles H. Gilbert" Cruise 80 (April 5-12, 1965): To collect various biological data and live tuna and mackerel-like species

for behavior studies were the objectives of this cruise by the research vessel Charles H. Gilbert, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii. The areas of operation were south of Oahu between Kaena Point and Penguin Bank, and not more than 20 miles from shore.

The results of the cruise included the return to the Honolulu Biological Laboratory's Kewalo Basin facility of 64 live skipjack tuna (aku), 3 yellowfin, and 1 little tuna.

During the cruise, 2 trolling lines were out continuously and 2 dolphin or mahimahi (Coryphaena hippurus) were caught. The usual standard watch for fish, birds, and aquatic mammals was maintained, and thermograph and barograph equipment were operated continuously.

M/V "Charles H. Gilbert" Cruise 81 (April 19-May 13, 1965): Biological data on skipjack tuna for blood-typing studies and oceanographic data were collected during this cruise by the Bureau's research vessel Charles H. Gilbert. Operations were conducted in fishing areas around the major islands of the Hawaiian chain and the banks near the islands of Nihoa, Necker, and French Frigate Shoals.

Biological data collected included: (1) a total of 2,195 whole blood and 387 serum samples taken from 15 skipjack tuna schools. In addition, 78 yellowfin whole blood samples were collected. (2) A total of 1,926 skipjack tuna were sampled for blood and serum. Those fish were also measured and their sex determined.

During the cruise, a total of 68 bird flocks were sighted; 29 of them were associated with skipjack tuna schools, 1 with 2 yellowfin schools, 2 mixed schools, and 2 with schools of porpoises. The remaining 34 were unassociated with a particular type of fish school.

A total of 19 yellowfin and 22 little tuna were brought back from Penguin Banks and Keahole Point, Hawaii, for study under the Bureau's Behavior Program in the bait tanks of the vessel. Tuna-like fish from stomach contents of yellowfin tuna caught off Lanai and samples of bait fish taken off Hanalei Bay, Kauai and French Frigate Shoals were preserved for further study.

Oceanographic operations during the cruise included taking the usual series of bathythermograms, sea surface and temperature samples, and the release of 620 drift cards.

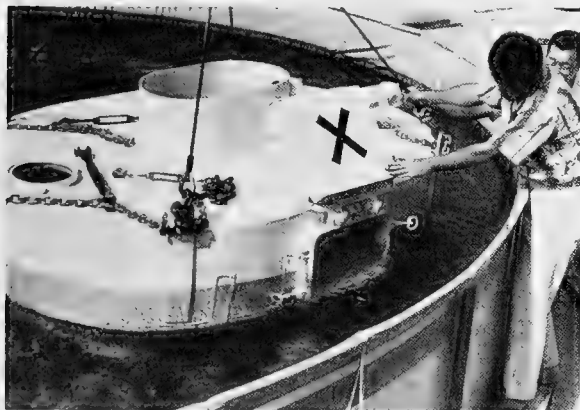
Note: See Commercial Fisheries Review, June 1965 p. 17.

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### SKIPJACK TUNA APPEAR IN LARGE NUMBERS AROUND HAWAIIAN ISLANDS:

The valuable skipjack tuna (aku), mainstay of Hawaii's commercial fishing industry, was available in record numbers in Hawaiian Island waters starting about May 1965. These have been collected in unprecedented numbers by the U. S. Bureau of Commercial Fisheries Biological Laboratory at Honolulu for scientific studies.

The research vessel Charles H. Gilbert of the Bureau's Honolulu Biological Laboratory completed the second of two skipjack tuna research cruises as of June 1965. The first cruise in late April and early May resulted in the collection of a record 2,195 blood samples from 15 schools of skipjack. By contrast, a cruise in much the same area 2 months earlier yielded only 70 samples from a single school of that tuna species.



Portable tank used to transfer skipjack tuna from vessel to plastic pool at Bureau's Biological Laboratory, Honolulu.

As of early June, the Charles H. Gilbert returned from the second research cruise during which 184 live skipjack tuna were caught--another record. The vessel also caught 3 little tuna (kawakawa) and 2 yellow-fin tuna. Those fish were returned to the Kewalo Basin facility of the Honolulu Biological Laboratory. They were handled according to skillful techniques developed by Bureau personnel of the Laboratory, the only

institution in the world which has been able to keep captive skipjack tuna alive for long periods.

In addition to collecting blood samples, scientists on the research vessel's first cruise took specimens from each school of fish. As is well known to skipjack tuna fishermen, single schools are usually composed of fish of almost identical size. This held true of the specimens collected by the Bureau's research vessel--those from the same school were of the same size.

The blood samples are used in a study of subpopulations of skipjack tuna. Subpopulations are reproductively isolated groups. Many such subpopulations go together to make up the whole population of skipjack in the Pacific Ocean, much the same as populations of the various nations go to make up the whole world population.

The fish taken on the vessel's second cruise are being used primarily for behavior studies at the Laboratory's Kewalo Basin tank complex. Scientists there are studying how well skipjack tuna see and hear, and testing their ability of smell. Other species of fish, notably salmon, have been shown to have acute olfactory senses. Salmon can recognize odors in fantastically low concentrations--one part in 80 billion, or about like a dash of bitters in a swimming pool.

Twenty of the skipjack caught were shipped immediately to Sea Life Park, where they were placed in the large reef tank. Scientists of the U. S. Bureau of Commercial Fisheries will be interested to see if they grow more rapidly or behave differently there than in the smaller plastic swimming pools used at the Bureau's Kewalo Basin facility.

Note: See Commercial Fisheries Review, July 1965, p. 20.

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### TRANSPORT TECHNIQUES FOR LIVE TUNA AIDS BEHAVIOR STUDIES:

Although fishery scientists know a great deal about how fish behave, much of that knowledge rests on experiments conducted with species that have little or no commercial value, with the notable exception of the salmon. The classical experiments in fish behavior have been performed largely on such small fish as the three-spined stickleback. The results, although fascinating and

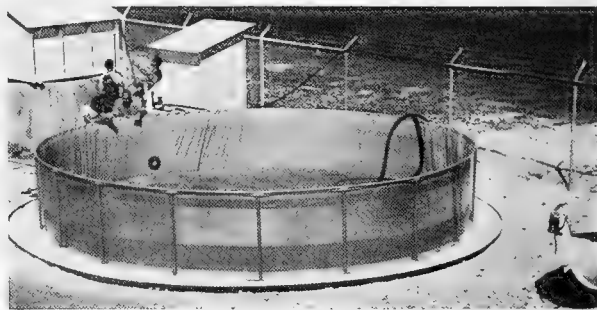
often extremely valuable in terms of what they disclose about an important element of the animal kingdom, are often not immediately applicable to commercial fisheries.

One difficulty that has beset efforts to conduct systematic experimental studies of the food fish of the open sea, such as the tunas which are the basis of a major United States industry, has been that of maintaining those relatively large and speedy fish in captivity. This difficulty has been solved at the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii.

Several times a year the Laboratory's research vessel Charles H. Gilbert noses along-side the dock in Kewalo Basin in Honolulu carrying on her crowded deck a cargo of what look like oversized bathtubs with lids on them. Each contains 5 to 10 live tuna caught only a few hours previously by the vessel's crew of expert fishermen. The fish are caught on a barbless hook. The fisherman swings them over an opening in the lid of the container. Another person steadies the line as the fish is lowered into the container. When tension on the line is relaxed the fish swims free.

The arrival of the Bureau's research vessel is the signal for a crane operator to stand by. Working rapidly, Bureau fishery scientists fit a bridle to the "bathtub" tanks. One at a time, they are lifted from the deck and taken a few yards away to the six 24-foot plastic swimming pools that are part of the Laboratory's complex for fish behavioral research. There the lids are unbolted from the containers. The crane lifts and then lowers the tanks into the sea water-filled swimming pools. Fishery scientists carefully tip them to let their valuable cargo of living tuna swim free.

From the time of catching until they are freed in the pool, the tuna have never been touched. They have spent only a few seconds in the air as they are swung from the sea surface to the tanks. Such methods have had impressive results. The Laboratory's Kewalo Basin facility often has as many as 60 or more tuna waiting their turn for behavior studies. As a result, the Bureau's Honolulu Biological Laboratory has become the only one in the world where live tuna are routinely collected for study. The procedure for handling the fish was worked out by a biologist who has been a member of the Laboratory staff since 1956.



One of the plastic pools used by the Bureau of Commercial Fisheries Biological Laboratory, Honolulu, to keep skipjack tuna alive for behavior studies.

Earlier methods of collecting the fish called for storing them in the vessel's bait-well and then transferring them by hand to the experimental tanks. The fish quickly died. The laboratory biologists then designed and had large iron tanks built. Those proved much more promising, but they were heavy and rusted badly. Reinforced plastic for the lightweight tanks is now used. The plastic has many advantages. Among them is the fact that being translucent, it allows the fish to see where it is going. It is much easier to handle the lighter plastic tanks than the heavy iron tanks.

It is only since methods of handling were perfected that fish behavioral scientists in the laboratory have been able to conduct controlled experiments with tuna. Already about a dozen scientific papers have emerged, each of them revealing previously unknown facets of tuna behavior. Under way are studies of how well the fish see and hear and smell, how they keep themselves afloat (tuna would sink if they did not keep moving constantly), what their reaction is to various kinds of food. From the broad base of such information may come new and improved methods of catching tuna.

One of the achievements of the Bureau's Honolulu Biological Laboratory has been its ability to keep skipjack tuna alive for several months. The skipjack, possibly the last great latent tuna resource, is the mainstay of the Hawaiian commercial fishery and is caught in large quantities off the coasts of Japan, and of Mexico and Central America. It has proven to be one of the most difficult fish species to maintain. Skipjack tuna are now kept alive as long as 6 months in the Laboratory's tanks.

\* \* \* \* \*



### SPECIALLY DESIGNED SONAR SYSTEM FOR LOCATING SUBSURFACE TUNA:

Ocean research scientists are turning to a new and powerful tool in their search for what has been called the last great latent tuna resource of the Pacific Ocean--the subsurface tuna. A specially designed frequency-modulated sonar system is being built in California which will be installed on the research vessel Townsend Cromwell of the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii, in spring 1966. Its installation will allow scientists to observe the behavior of tuna "in their natural element, the sea, and give us insight into methods of capture that do not rely on observing surface tuna schools," according to the Bureau Area Director at Honolulu.

Sonar, as its name implies, uses sound for exploration of the undersea world. Sound emitted by the device is reflected by solid objects. The users can then plot the direction and distance of the objects from the vessel. Bureau scientists at the Honolulu Biological Laboratory say that their sonar will have a range of almost a mile. At 100 yards it will enable them to distinguish between fish no farther apart than 7 inches.

The Laboratory's chief interest, however, is not in individual fish, but in schools of fish. The sonar will permit scientists to follow a school as it swims out of sight beneath the surface of the sea. Previous research has suggested that they will be able to distinguish between schools of different kinds of fish, since each species may offer a typical "signature" on the sonar.

That the tuna range throughout the Pacific Ocean is well known, but schools are rarely seen at the surface except fairly near land. That they also spend a part of their lives in the ocean depth is proved by long-line catches (which include big tuna, particularly big-eyed and yellowfin) several hundred feet below the surface.

Of particular interest to the scientists of the Honolulu Biological Laboratory are the skipjack tuna. That tuna species forms the mainstay of the Hawaiian fishing industry. Skipjack are also caught as small fish off the west coast of the tropical Americas. There is evidence that some fish migrate from the eastern Pacific to the central Pacific. But skipjack schools have not been sighted in the area between the eastern and central Pacific;

they are not seen until some of them are caught in the fishery off the Hawaiian Islands.

Results of the sonar studies are expected to be useful in the design of new types of fishing gear designed to harvest the subsurface tuna.

\* \* \* \* \*

### OBSERVATIONS ON TUNA RESEARCH:

The following observations were recently made by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii, based on its tuna research program:

Albacore Tuna Ecology: Catch rates in terms of numbers of South Pacific albacore tuna caught per 100 hooks did not show any marked trend during 1963 and 1964. On the other hand, the same data, converted into catch in weight per 100 hooks, showed a significant decrease in 1964 when compared to 1963. This was due to a decrease in mean size of fish taken in the fishery. More significant, perhaps, was the decrease in catch per day's fishing (as expressed in weights) in 1963 and 1964 as compared to earlier years (1959-62). There is evidence that this fishery has followed a "normal" course of development, from that of exploiting a relatively virgin stock in which a surplus of older, larger fish had accumulated over the years, to the present stage in which somewhat lower catch rates are obtained because of the earlier removal of the "surplus" fish. Some comparative size data indicate that there were more of the larger fish taken in earlier years.

Tuna Behavior: Visual acuity experiments were conducted with a 5-pound yellowfin tuna. Results coincided with those for a 9-pound yellowfin, although variation in visual acuity with size of fish had been expected.

Working with a 50-centimeter (19.7 inches) yellowfin, a hearing curve for frequencies was obtained ranging between 40 and 1,000 cycles per second. The lower limit was imposed by the instrument used. The upper limit was selected arbitrarily.

On the basis of present knowledge, yellowfin tuna, like other fish, hear best in the frequency range of 300 to 500 cycles per second, and the experiment made bore this out. Sounds within that frequency range occur in the sea. An example is the sound made by swimming

anchovy. The response of tuna to that sound (recorded) will be tested at sea during the summer.

Twice the hydrophone picked up a distinct "snap" sound just as the yellowfin engulfed a piece of food. This was the first time a tuna was heard making a sound other than the splashing that occurs when they break through the surface of the water.

\* \* \* \* \*

#### TRADE WIND ZONE

##### OCEANOGRAPHIC STUDIES CONTINUED:

M/V "Townsend Cromwell" Cruise 15 (April 7-30, 1965): The flow pattern for the area investigated during this cruise in the central North Pacific by the research vessel Townsend Cromwell showed changes similar to those observed during a cruise (April 12-May 4, 1964) the year previous. The vessel, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii, on April 30 completed the 14th in a series of oceanographic cruises to determine the rate of change in the distribution of properties in the trade wind zone of the central North Pacific. The area of operations was bounded by latitude  $10^{\circ}$  N.,  $27^{\circ}$  N. and longitude  $148^{\circ}$  W.,  $158^{\circ}$  W.

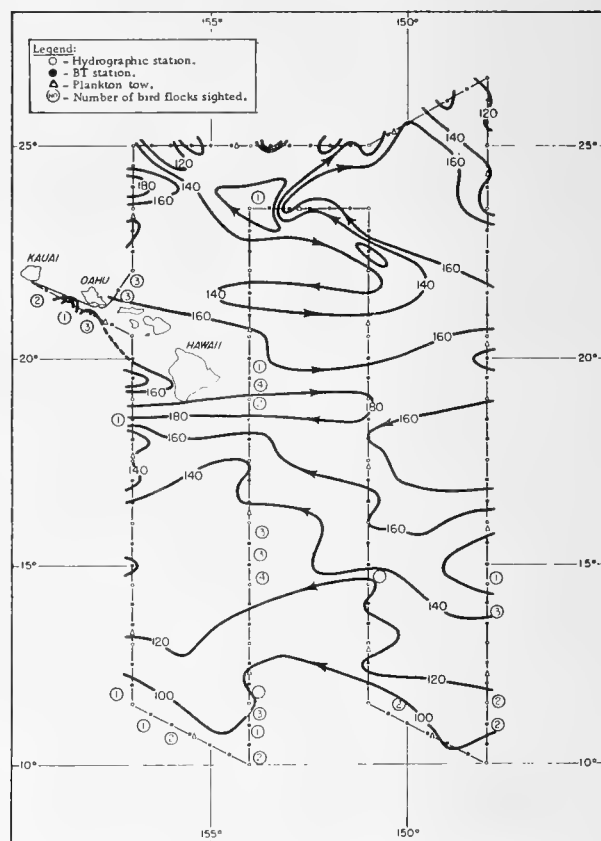
During this cruise it was observed that while the intensity of the westerly flow south of  $20^{\circ}$  N. was nearly the same as in March 1965, the transport was greater with an overall increase in the depth of the  $20^{\circ}$  isotherm of about 20 meters (78.7 feet). The flow south of  $20^{\circ}$  N. had changed from the usual southwesterly to an almost northwesterly set. The random flow to the north of  $20^{\circ}$  N. was similar to that in March with the large anticlockwise eddy still centered around the same station.

The increase in temperature south of  $16^{\circ}$  N. which was observed during March 1965 appeared to have ceased with maximum temperatures at slightly over  $26^{\circ}$  C. ( $78.8^{\circ}$  F.). North of  $20^{\circ}$  N., cooling had ceased and a rise of nearly  $1^{\circ}$  C. ( $1.8^{\circ}$  F.) in the minimum temperature occurred.

The samples run at sea showed an increase in salinity in the southern region which may reflect the flushing of the low salinity water present in the months previous to this cruise. The high salinity water of the north had retreated even farther north than had previously been observed.

A total of 43 oceanographic stations was occupied along the cruise track. At each station, temperatures and samples for salinity analysis were obtained at 20 depths to 1,500 meters (4,921 feet). Deep casts to 4,000 meters (13,123 feet) were taken at two stations, and a cast to 5,000 meters (16,404 feet) was taken at one station.

A small increase in the number of bird flocks was observed during the April cruise, with 50 flocks in the regular cruise area compared to 43 during March 1965, and 16 in April 1964. Most of the flocks were distributed evenly over the southwest half of the cruise pattern.



Track chart of the research vessel Townsend Cromwell Cruise 15 (April 7-30, 1965), showing depth contours of the  $20^{\circ}$  C. isotherm in meters.

Other operations during the cruise included taking the usual series of bathythermograms, sea surface temperatures (including the use of a Hytech salinity-temperature-depth in situ recorder), release of drift bottles, and collection of other oceanographic data.

Note: See *Commercial Fisheries Review*, July 1965 p. 20, August 1964 p. 17.

## Clams

### CERTAIN POTOMAC RIVER AREAS CLOSED TO SOFT-SHELL HARVESTING:

By an order effective June 19, 1965, the Potomac River Fisheries Commission prohibited soft-shell clam operations in Areas A, C, E, G, J, M, and P of the Potomac. (In addition, soft-shell clam dredging is not allowed upriver above the Charles County-St. Mary's County line.)

Note: For a description of the specified closed areas write to:  
Potomac River Fisheries Commission, P.O. Box 128, Colonial Beach, Va. 22443.



## Columbia River

### CLOSURE OF SUMMER SALMON SEASON:

At a public hearing held in Portland, Ore., June 14, 1965, the Washington State Department of Fisheries and the Oregon Fish Commission jointly closed the summer commercial salmon season on the Columbia River until July 29, 1965. Sport fishing for salmon on the Columbia was also closed from June 21 to July 29 by the Washington Fisheries Director. The Oregon Game Commission was expected to take comparable action. (The closures did not affect the shad commercial fishery below Bonneville Dam which was allowed to continue in certain areas from June 16 through July 3.)

Fisheries agencies in Washington and Oregon are concerned about the poor summer runs of chinook and sockeye salmon in the Columbia. Fisheries biologists of both States estimate the total summer runs of the two salmon species will not exceed the bare minimum of 80,000 to 90,000 of each species needed to perpetuate the runs.

Concern was expressed that commercial landings from the Indian gill-net fishery above Bonneville Dam might reduce the salmon runs below the numbers desired for spawning escapement.

\* \* \* \* \*

### FEDERAL FUNDS ALLOCATED TO REPAIR FLOOD DAMAGE TO FISHERY FACILITIES:

Under the Columbia River Fishery Development Program, Federal and State agencies in Washington, Idaho, and Oregon are sharing about \$996,000 in Federal funds to

repair and replace fishery facilities damaged by floods in late 1964 and early 1965. The money is being used to clear the rivers in the Columbia Basin of log jams, remove debris from streams and tributaries, repair damaged fish hatcheries and fish ladders, and replace or repair broken fish screens.

Washington State's \$96,000 allotment includes funds for stream clearance and repairs to five fish hatcheries.

The Idaho Department of Fish and Game is receiving \$365,000 for stream improvement. The Agency is using the money to remove and clear debris caused by a large log jam on the Salmon River, replace roadways and cofferdams, and repair cave-ins on the Selway Falls fish ladder.

In Oregon, of the \$535,000 total fund, \$63,500 is allocated to the Oregon Fish Commission for rehabilitation of 5 fish hatcheries, plus \$110,000 for stream clearance. The Oregon Game Commission is receiving \$61,000 for repair and replacement of approximately 50 screens in the John Day area and 10 in the Walla Walla area. The U. S. Bureau of Commercial Fisheries will use \$300,500 of the Oregon allotment to repair Federal installations--Eagle Creek, Little White Salmon, and Willard National Fish hatcheries.

The Eagle Creek National Fish Hatchery and the Cascade Salmon Hatchery were made completely inoperable by the flood. Prompt action by the crews of both stations, who worked on a 24-hour basis using pumps and other temporary aids which they devised, were able to save millions of fish from complete destruction. Emergency pumps were installed and both stations were returned to full capacity within 30 days.

Note: See Commercial Fisheries Review, March 1965 p. 28.



## Consumption

### U. S. PER CAPITA CONSUMPTION FOR FISHERY PRODUCTS, 1947-65:

The U. S. civilian per capita consumption of fishery products remained unchanged in 1964 at 10.6 pounds (edible weight), the same as in the previous two years. From 1963 to 1964, consumption of fresh and frozen fishery products increased slightly while that for

United States Civilian Per Capita Consumption of Fishery Products (Edible Weight), Selected Years, 1947-65						
Type	Preliminary Indications for 1965	1/ 1964	1963	1962	Average 1957-59	Average 1947-49
..... (Pounds) .....						
Fish (edible weight) - Total, .....	10.7	10.6	10.6	10.6	10.5	10.7
Fresh and frozen .....	3/	5.9	5.7	5.8	5.7	5.9
Canned 2/ .....	3/	4.2	4.4	4.3	4.2	4.2
Cured .....	3/	.5	.5	.5	.6	.6

1/Preliminary.  
 2/Excludes canned food products containing small quantities of fish, such as clam chowder.  
 3/Not available.

canned fish dropped proportionally. The per capita consumption of cured fishery products was unchanged for the years 1962 through 1964.

Preliminary indications for 1965 are that per capita consumption will increase slightly. (National Food Situation, NFS-112, May 1965, U. S. Department of Agriculture.)

Note: See Commercial Fisheries Review, January 1965 p. 25.



## Federal Aid for Sport Fish and Wildlife Restoration

### INTERIOR APPORTIONS FUNDS TO STATES FOR FY 1966:

Distribution of \$15 million in Federal-aid funds for fish and wildlife restoration projects was made to the 50 states on July 1, 1965, announced Secretary of the Interior Stewart L. Udall. This was an increase of \$800,000 over a similar distribution a year earlier.

Of the \$15 million allocated, \$12 million is for wildlife restoration and \$3 million is for sport fishery projects. An additional apportionment for fish and wildlife projects will be made in the fall of 1965. The apportionments made in July will enable states with small reserve funds to finance their Federal-aid operations from July 1 until the final apportionment for the year is made in the fall.

Fish and wildlife restoration funds come from Federal excise taxes collected from manufacturers, importers, and producers of certain types of hunting and fishing equipment. Under the Federal-aid programs, states spend their own funds on approved projects and are then reimbursed for up to 75 percent of the cost. The laws establishing those programs also provide \$10,000 each for Guam, the Commonwealth of Puerto Rico, and the Virgin Islands. The total 1966 fiscal year ap-

portionments for those areas are included in the funds distributed on July 1.

Distribution of the funds is based on the number of paid license holders in a state and the state area. The Federal aid in Fish and Wildlife Restoration programs are administered by Interior's Bureau of Sport Fisheries and Wildlife.

Note: See Commercial Fisheries Review, August 1964 p. 20



## Federal Purchases of Fishery Products

### DEPARTMENT OF DEFENSE PURCHASES, JANUARY-APRIL 1965:

Fresh and Frozen: Purchases of fresh and frozen fishery products in April 1965 for the use of the Armed Forces were down 11 percent in quantity and 21 percent in value from the previous month. The drop was due mainly to smaller purchases of such high-priced items as shrimp, scallops, and oysters.

Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, April 1965 with Comparisons

QUANTITY				VALUE			
April		Jan.-Apr.		April		Jan.-Apr.	
1965	1964	1965	1964	1965	1964	1965	1964
2,029	1,734	8,707	8,524	1,225	903	5,551	4,458
(1,000 Lbs.)				(\$1,000)			

Compared with the same month in 1964, purchases in April 1965 were up 17 percent in quantity and 36 percent in value. Average prices for shrimp, scallops, and Pacific oysters were much higher in April 1965. Purchases in April 1965 were up for shrimp, flounder fillets, ocean perch fillets, and haddock fillets and portions. But purchases were down for scallops and halibut steaks.

Total purchases in January-April 1965 were up 2 percent in quantity and 24 percent in value from those in the same period of 1964. The increase in value was due almost

Table 2 - Principal Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, April 1965 with Comparisons

Product	April				Jan.-Apr.	
	1965		1964		1965	1964
	Quantity Pounds	Avg. Cost Cents/Pound	Quantity Pounds	Avg. Cost Cents/Pound	Quantity Pounds	Quantity Pounds
<b>Shrimp:</b>						
raw headless . . . . .	109,000	99	132,600	82	385,800	414,650
peeled and deveined . . . . .	89,500	143	44,986	108	409,160	276,208
breaded . . . . .	297,600	86	322,000	67	1,227,520	1,301,200
molded and breaded . . . . .	77,650	66	37,900	58	233,550	152,900
Total shrimp . . . . .	573,750	95	537,486	73	2,256,030	2,144,958
Scallops . . . . .	90,900	76	219,350	52	629,784	910,350
<b>Oysters:</b>						
Eastern . . . . .	39,120	99	24,502	99	246,610	351,420
Pacific . . . . .	14,912	81	19,314	52	112,564	93,120
Total oysters . . . . .	54,032	94	43,816	78	359,174	444,540
<b>Fillets:</b>						
Cod . . . . .	32,000	34	45,520	30	188,270	172,766
Flounder . . . . .	246,700	39	141,000	31	1,049,200	1,314,816
Ocean perch . . . . .	362,250	30	236,100	30	1,370,540	1,247,220
Haddock . . . . .	138,000	33	99,530	29	593,550	668,774
Haddock portions . . . . .	177,000	44	-	-	675,054	8,650
<b>Steaks:</b>						
Halibut . . . . .	52,800	50	116,770	35	375,220	423,795
Salmon . . . . .	10,960	69	15,675	68	43,700	64,977
Swordfish . . . . .	500	56	700	51	1,760	6,010

entirely to the higher prices prevailing in 1965. A sharp increase in purchases of haddock portions was almost offset by smaller purchases of scallops, eastern oysters, flounder fillets, haddock fillets, and halibut steaks.

**Canned:** Purchases of canned tuna and canned sardines for the Armed Forces in January-April 1965 were running considerably ahead of the same period in 1964. Purchases of canned salmon were light in early 1965. (Most canned salmon purchases for the Armed Forces are made in the fall months after the main canning season ends.)

Table 3 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, April 1965 with Comparisons

Product	QUANTITY				VALUE			
	April		Jan.-Apr.		April		Jan.-Apr.	
	1965	1964	1965	1964	1965	1964	1965	1964
Tuna . . . . .	315	2	2,504	1,459	142	1	1,083	645
Salmon . . . . .	1	-	9	679	1	-	8	416
Sardine . . . . .	70	28	216	107	21	11	110	41

**Freeze-Dried:** Purchases for the Armed Forces in April 1965 included 2,103 pounds of freeze-dried shrimp priced at about \$12 a pound.

Notes: (1) Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than shown because data on local purchases are not obtainable.

(2) See Commercial Fisheries Review, June 1965 p. 19.

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#### PALLETIZED UNIT LOADS FOR CANNED TUNA PURCHASES BY THE DEFENSE DEPARTMENT TO BE REQUIRED ON TEST BASIS:

The military services have expressed a strong desire to receive subsistence items in palletized loads whenever possible and practical. As a result, the Defense Subsistence Supply Center announced May 20, 1965, in Headquarters Notice to the Trade No. 54 (65) that a number of items have been selected to be palletized by suppliers on a test basis. Canned tuna is included in the test. Requests for bids on selected quantities of canned tuna will specify the need for palletization.

Palletized unit loads of canned tuna will require full 4-way entry, wing type, 40 inch by 48 inch, seasoned wood pallets. Top and bottom of shipping cases will be glued to each other and to pallets by two narrow strips of glue on each case. The palletized unit load is limited to the overall maximum dimensions of 43 inches in length, 52 inches in width, and 54 inches in height, and to a maximum weight of 2,100 pounds.

The following Military Specifications will be referenced in purchase documents for canned tuna when palletization is required:

- (a) MIL-L-0035078A, Loads, Unit:  
Preparation of Non-Perishable  
Subsistence In

- (b) MIL-P-15011E, Pallets, Material Handling, Hardwood, Post Construction, 4-way
- (c) MIL-A-13374B, Adhesive Dextrin
- (d) MIL-STD-731, Quality of Wood Members for Containers and Pallets
- (e) FF-N-105A - Nails, Wire, Brads, and Staples

Additional information will be available from Regional Offices of the Defense Subsistence Supply Center.



## Fish Meal

### COMPACT PROCESSING PLANT BUILT BY NORWEGIANS:

Fish meal processors in the United States have shown considerable interest in a compact fish-meal processing plant built in Norway and sold in this country through a New York firm. The Norwegian manufacturers feel there is a ready market for this equipment in the United States.

The Norwegian-built plant has a fish meal production capacity ranging from 10 to 60 tons every 24 hours, and comes in three sizes, each of which is adaptable to ship or shore installation. The plant's operation is essentially the same as that of a menhaden reduction plant. It is possible to add equipment to add the stickwater concentrate into the press cake as it is being dried, thereby utilizing all of the product.

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## Fish Protein Concentrate

### NEW MODEL-SCALE SOLVENT-EXTRACTION PROCESSING UNIT IN OPERATION:

The accelerated Fish Protein Concentrate program of the U. S. Bureau of Commercial Fisheries took another major movement forward in May 1965 when the new model-scale unit for the study of chemical fish protein concentrate-processing methods went into operation. Designed and constructed by the engineering staff of the Battelle Memorial Institute under a Bureau contract, the unit was installed in leased facilities completed about that time at Beltsville, Md., near the Bureau's College Park Technological Laboratory.

The new unit is extremely flexible in that it will permit engineering studies on solvent-extraction procedures using many different kinds of solvents and many different conditions of time, temperature, and quantities of solvent. The operation is essentially a batch operation and has a production rate of about 100 pounds of finished product a day. The installation consists of a mixing tank in which the raw ground fish and the solvent under study are slurried; two extractors; a centrifuge for the separation of liquid and solids; a solvent recovery system; and a vacuum tumbling dryer for the desolventization and final drying of the product. Tanks for solvent storage and for the collection of the dissolved material (miscella) are also provided.

Presently under study is a method for the production of fish protein concentrate from North Atlantic red hake, using isopropyl



Model-scale unit for producing fish protein concentrate by the solvent-extraction process installed in leased building and being operated by the Bureau of Commercial Fisheries technological laboratory, College Park, Md.



alcohol as a dehydrating and defatting agent. By late summer 1965, a commercially feasible method based on hake and isopropyl alcohol is scheduled to be available, as well as a complete definition of the characteristics of the product from this process and its nutritional value and wholesomeness.



## Great Lakes

### CHANGES PROPOSED IN COMMERCIAL FISHING REGULATIONS:

Several proposed changes in Great Lakes commercial fishing regulations were tentatively approved in June 1965 by the Conservation Commission of the State of Michigan. One was a recommendation by Michigan's Department of Conservation to close commercial fishing for lake trout in Lake Michigan on or after October 1, 1965.

The proposed restriction on lake trout commercial fishing in Lake Michigan is identical to that which has been in effect for several years in Lake Superior, and is tied to the long-range program to restore lake trout in the upper Great Lakes. The program is designed to protect lake trout populations being built up in Lake Michigan's northern waters, starting with the initial release in June 1965 of 1.2 million yearling fish.

As an exception to the general shutdown on commercial fishing for lake trout in Lake Michigan, a small number of licensed operators will be contracted and permitted to take lake trout so that information can be collected on survival, growth, reproduction, and distribution of planted stocks. As in the case of Lake Superior, those contract commercial fishermen will be limited to a quota each year--a lake trout catch quota carefully calculated to have no adverse effect on planted lake trout populations.

Another Great Lakes commercial fishing change approved by the Michigan Conservation Commission would provide a uniform November 1-30 closed season for taking whitefish in Lakes Huron, Michigan, and Superior. The revised closed season is timed with the peak spawning period for whitefish in all three of those lakes. Whitefish are now off limits to commercial fishermen from October 15 through December 10 in Lakes Michigan and Huron, and from November 1

through November 26 in Lake Superior. Also endorsed by the Commission is a measure which would allow commercial fishermen operating in those three lakes to take lake trout and whitefish with trap and pound nets in any depth of water. The use of such nets is now limited to 80 feet of water or less.

The last set of changes in Great Lakes commercial fishing regulations would lift the closed season and minimum size limit on yellow perch in Lake Erie where those controls are no longer needed.

Except for the lake trout restriction in Lake Michigan, the changes reflect the effort of Michigan's Department of Conservation to liberalize commercial fishing regulations where research findings point up the need and and practicality of doing so. The chief of the Department of Conservation's fish section explained that Michigan's present controls over commercial fishing in the Great Lakes are archaic and that they are the most conservative ones in effect in those waters. He added that many regulations have become outdated by shifts in the fishery of the Great Lakes, and that steps should and will be taken to bring them in line with today's developments.

The measures recently approved by the Michigan Conservation Commission will be discussed at public hearings. They will then go through a series of administrative steps before being brought back to the Commission for final action. (*News Bulletin*, Michigan Department of Conservation, June 17, 1965.)

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### LAKE TROUT RESTOCKING PROGRAM IN UPPER LAKES FOR 1965:

Continuing efforts to revive lake trout populations of the upper Great Lakes were to be stepped up in June 1965 with the release of over 3.1 million yearling fish, according to the Great Lakes Fishery Commission. Included in the June stocking schedule were some 1.9 million young fish for Lake Superior where 10 million trout have been planted since state, Federal, and Canadian agencies were coordinated under the Commission to start that phase of restoration work in 1958.

Sparked by the progress of sea lamprey control in tributaries of Lake Michigan, more than 1.2 million yearling lake trout

were to be set free in that lake's upper waters during the early part of June. It will be the first step to restock northern Lake Michigan where sea lamprey are scheduled to come under control by 1967. Because of their small size, fish going into those waters are expected to be safe from lamprey attacks during the next two years before lamprey populations are substantially reduced.

In Lake Superior, where continued good signs are seen of survival and growth among lake trout planted earlier, the June 1965 planting program was scheduled for the release of 900,000 fish in State of Michigan waters. Of that total, 600,000 fish would be released between Keweenaw Bay and Grand Marais. Other plantings along Michigan's shores included 200,000 fish in the Ontonagon area, and another 100,000 in lower Whitefish Bay. Most of the fish were raised from eggs supplied by the State of Michigan Conservation Department's Marquette Hatchery which is providing the bulk of planting stock for the restoration program.

Some 470,000 yearling trout were to be released on the Canadian side of Lake Superior by the Ontario Department of Lands and Forests. Wisconsin and Minnesota were slated to stock their Lake Superior waters with 460,000 and 100,000 fish, respectively.

Lake Michigan plantings included the release of 850,000 trout at three locations between Seul Choix Point and Epoufette. Grand Traverse Bay and the Beaver Islands area would each receive 100,000 small lake trout. Some 200,000 fish were to be stocked off Door Peninsula in Wisconsin waters to round out the 1965 program for Lake Michigan. Planting stock for the entire Lake Michigan operation will be from the Federal Jordan River Valley Hatchery in northern Michigan. (News Bulletin, Michigan Department of Conservation, Lansing, May 27, 1965.)

Note: See Commercial Fisheries Review, May 1965 p. 20.

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#### ALEWIFE POPULATION IN LAKE MICHIGAN CONTINUES TO INCREASE:

The alewife population in Lake Michigan is still increasing sharply, with the 1964 hatch of that species nearly 50 times more abundant than in 1962, according to the U. S. Bureau of Commercial Fisheries Regional Office, Ann Arbor, Mich. The alewife, first

reported in Lake Michigan in 1952, was not fished commercially prior to 1956. The alewife catch in Lake Michigan in 1964 was about 11.5 million pounds which was more than double the 1963 catch of that species.

Fish meal plants built in Milwaukee and Sturgeon Bay, Wis., in 1964 were expected to enable commercial fishermen to increase alewife production substantially resulting in additional economic benefits and also providing some degree of control over the population explosion of that species which has infiltrated a good part of the western Great Lakes.

The alewife is a native ocean fish species. In its newer habitat of the Great Lakes it seldom exceeds 8.5 inches in length, is quite oily, and very thin. (Great Lakes News Letter, March-April 1965.)

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#### UNITED STATES-CANADIAN COMMERCIAL FISHERY LANDINGS, 1964:

The U. S. Great Lakes commercial fishery catch dropped to a new low in 1964 while Canadian landings that year were the lowest since 1952. The 1964 U. S. landings of 52.9 million pounds (estimated ex-vessel value \$5.0 million) were 5 percent lower than in 1963 and the Canadian catch of 34.8 million pounds (ex-vessel value \$4.1 million) was about 25 percent less than in 1963. Landings were lower in most of the Great Lakes except Lake Michigan where they increased substantially from the previous year.



Fig. 1 - Fresh-water fish packed with ice in wooden boxes and tubs.

Lake Michigan's 1964 landings of 25.7 million pounds accounted for nearly half the total U. S. Great Lakes catch. The gain was due to an increase of more than 100 percent in the catch of alewives. Totaling some 11.5 million pounds, that low-value species is used for animal food and fish meal, and accounted for 45 percent of Lake Michigan's 1964 landings. Yellow perch landings were up in 1964 but the chub catch dropped by one-third down to 5 million pounds.

Lake Erie was the most productive of the Great Lakes and in 1964 accounted for a U. S.-Canadian commercial catch of about 38.7 million pounds, a decline of 26 percent

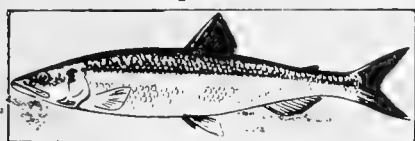


Fig. 2 - Smelt.

or 13.8 million pounds less than in 1963. Lake smelt accounted for half the Canadian 1964 commercial catch in Lake Erie with a total of 12.7 million pounds, while the U. S. catch of that species was less than a half million pounds.

In the Lake Huron-Georgian Bay area of the Great Lakes, the 1964 catch of chubs, as the leading commercial species, was lower than the previous year. The overall catch in Ontario waters increased in 1964 and there was a gain in both the Canadian and U. S. catch of yellow perch and whitefish.

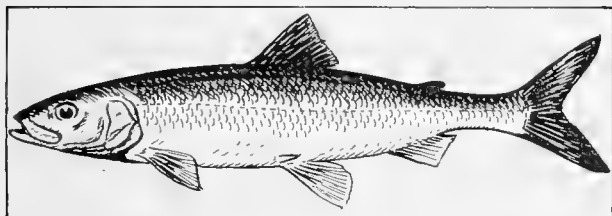


Fig. 3 - Lake herring.

The 1964 landings of herring in Lake Superior--the mainstay of commercial fishing in that lake--were lower than in 1963 but the smelt catch in U. S. waters of that lake increased. In 1964, the lake trout fishery in Lake Superior was again restricted to encourage the recovery of that species but at the same time allowing the continuation of biological studies. The U. S.-Canadian catch of lake trout in 1964 totaled about 219,000 pounds, only slightly more than in 1963. (Great Lakes News Letter, March-April 1965.)

Note: See Commercial Fisheries Review, March 1965 p. 33; October 1964 p. 25.

## Gulf Fisheries Explorations and Gear Development

### BOTTOM-TRAWL FISH POTENTIAL OFF FLORIDA WEST COAST SURVEYED:

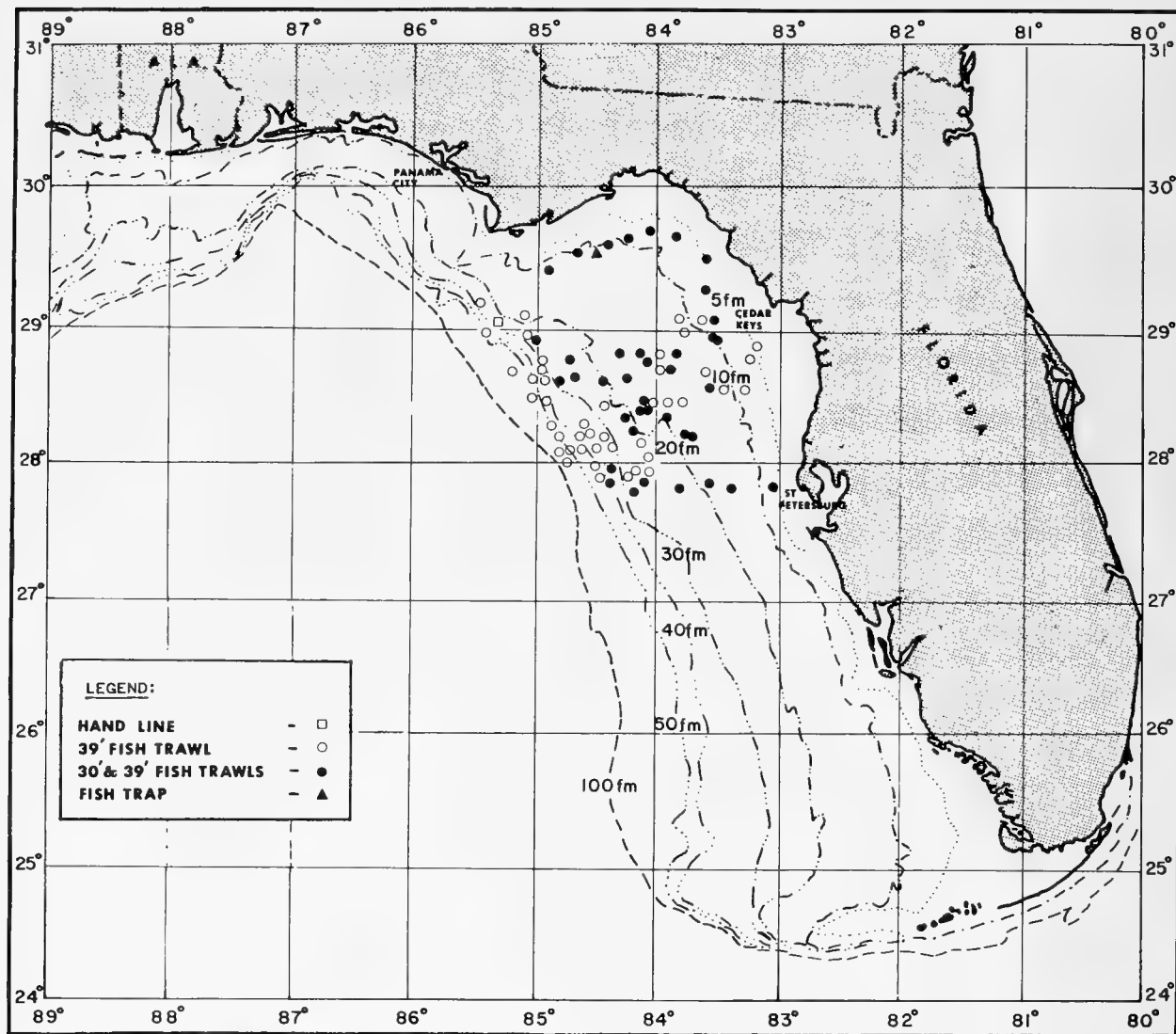
M/V "Hernan Cortez" Cruise 1 (April 29-May 21, 1965): The first cruise of a two-month survey of the bottom-trawl fish potential off Florida's west coast was conducted under a cooperative agreement between the Florida Conservation Department and the U. S. Bureau of Commercial Fisheries by the State vessel Hernan Cortez. The survey was designed to determine the species present in the area and to obtain information on their availability to trawling gear within the 5-50 fathom depth range.

A total of 88 exploratory trawling stations were made in the area between Cape San Blas and Tampa Bay, using roller-rigged 30-foot and 39-foot fish trawls. The trawls were small-scale versions of commercial bottom-fish trawls used in the New England area. They were made of nylon twine with mesh sizes tapering from 3-inch stretched in the body to  $1\frac{5}{8}$ -inch stretched mesh in the cod end and fished on standard  $5\frac{1}{2}$ -foot and 6-foot bracket doors.

Very poor trawling bottom was encountered over most of the survey area, with frequent snags, hang-ups, and trawl damage. Coral, rock, and loggerhead sponge presented the principle trawling hazards. Many hauls included large quantities of rock and up to 2,000 pounds of sponge.

Fish catches on this cruise were generally small. Vermilion snapper, grunts, goatfish, and two species of sea bass provided the only signs of commercial significance. Of the 64 catches of sea bass, 48 were bank sea bass and 19 black sea bass. A depth preference of the two species was observed with bank sea bass caught in waters deeper than 10 fathoms, while black sea bass were found inside the 10-fathom curve. Both those species were taken together on three occasions, each time from 10 fathoms.

Surface school observations revealed a few jumping fish, probably little tuna (*Euthynnus alletteratus*). Surface schools tentatively identified as scad (*Decapterus* sp.) were observed 6 to 7 miles offshore from Cape St. George to Cape San Blas. (For area of operations during the cruise see map on page 40.)



Area of operations during M/V Herman Cortez Cruise 1 (April 29-May 21, 1965).



## Gulf Fishery Investigations

### SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-29 (May 19-June 2, 1965): Small brown shrimp (68 count) were dominant in most trawl catches made in the up to 10-fathom depth during this cruise by the chartered research vessel Gus III. The vessel, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex., worked 8 statistical areas in another of a series of cruises in a continuing study of shrimp distribution in the Gulf of Mexico.

The vessel made 31 standard 3-hour tows with a 45-foot flat trawl, 48 plankton tows, 55 bathythermograph (BT), and 176 water (Nansen bottle) casts.

The more productive areas for small brown shrimp also yielded moderate catches of larger shrimp from various depths, and generally spotty catches of white shrimp ranging from 15-20 to 26-30 count.

The largest catch of the cruise was 75 pounds of brown shrimp (21-25 count) from a tow in the over 20-fathom depth range of area 21. The other depth ranges of that area accounted for mostly small brown shrimp of



of fish meal and about 5.8 million pounds of marine-animal oil. Fish solubles production amounted to 3,177 tons--a decrease of 715 tons as compared with April 1964.

\*\*\*\*\*

Major Indicators for U. S. Supply, April 1965: United States production of fish meal and fish oil in April 1965 was higher by 32.9 and 131.2 percent, respectively, as compared with April 1964. Production of fish solubles was lower by 18.4 percent.

Major Indicators for U.S. Supply of Fish Meal, Solubles, and Oil, April 1965					
Item and Period	1/1965	1964	1963	1962	1961
Fish Meal: (Short Tons) . . . . .					
Production:					
April . . . . .	10,781	8,110	8,340	9,359	6,112
Jan.-Apr. 2/ . .	18,962	15,651	16,314	20,161	13,657
Year 3/ . . . . .	-	235,252	255,907	312,259	311,265
Imports:					
April . . . . .	39,721	55,953	26,607	26,390	19,060
Jan.-Apr. . . .	134,909	162,371	133,083	89,164	63,393
Year . . . . .	-	493,143	376,321	252,307	217,845
Fish Solubles 4/:					
Production:					
April . . . . .	3,177	3,892	5,037	4,305	2,965
Jan.-Apr. 2/ . .	5,606	7,293	10,398	9,976	8,799
Year 3/ . . . . .	-	93,296	107,402	124,649	112,254
Imports:					
April . . . . .	315	457	218	323	220
Jan.-Apr. . . .	2,839	1,539	1,678	3,153	729
Year . . . . .	-	4,505	7,112	6,308	6,739
Fish Oils: (1,000 Lbs.) . . . . .					
Production:					
April . . . . .	10,152	4,391	6,551	5,645	3,344
Jan.-Apr. 2/ . .	11,861	5,824	7,852	8,162	4,665
Year 3/ . . . . .	-	180,198	185,827	250,075	258,118
Exports:					
April . . . . .	145	22,773	28,480	10,270	7,351
Jan.-Apr. . . .	11,743	46,693	75,401	51,593	43,900
Year . . . . .	-	151,469	262,342	123,050	122,486

1/Preliminary.

2/Data for 1965 based on reports which accounted for the following percentage of production in 1964: Fish meal, 89 percent; solubles, 89 percent; and fish oils, 99 percent.

3/Small amounts (10,000 to 25,000 tons) of shellfish and marine animal meal and scrap not reported monthly are included in annual totals.

4/No homogenized fish was produced in 1964.

\*\*\*\*\*

Production by Areas, May 1965: Preliminary data on U. S. production of fish meal, oil, and solubles for May 1965 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

U.S. Production 1/ of Fish Meal, Oil, and Solubles, May 1965 (Preliminary) with Comparisons			
Area	Meal Short Tons	Oil 1,000 Pounds	Solubles Short Tons
May 1965:			
East & Gulf Coasts . . . . .	22,631	22,253	9,765
West Coast 2/ . . . . .	1,720	290	1,139
Total . . . . .	24,351	22,543	10,904
Jan.-May 1965			
Total . . . . .	43,421	34,491	17,717
Jan.-May 1964			
Total . . . . .	47,698	35,763	20,152

1/Does not include crab meal, shrimp meal, and liver oils.

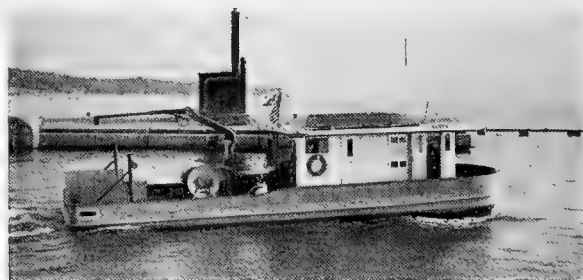
2/Includes American Samoa and Puerto Rico.



## Inland Fisheries Research

### NEW TYPE RESERVOIR FISHERY RESEARCH VESSEL:

The new reservoir fishery research vessel, the *Hiodon*, of the U. S. Bureau of Commercial Fisheries, was launched at Saugatuck, Mich., in April 1965.



Reservoir fishery research vessel *Hiodon* of the U.S. Bureau of Commercial Fisheries.

The new steel vessel (45 feet long, 14 feet wide, and 16 gross tons) is designed for shallow-water operation. She has a flat bottom and tunnel stern which completely protects its twin propellers and rudders. Propulsion power is supplied by two 85-hp. diesel engines. Equipped with the latest in hydraulic deck gear (including separated trawl winches, net reel, power block, and articulated crane, all of which are controlled from a central station), the vessel can engage in a variety of fishing methods.

The Bureau's new research vessel is also equipped with a roofed and partially enclosed laboratory area and has two 600-gallon fish tanks with circulating water systems for holding live fish. She has a detachable heavy-duty axle and wheel assembly to facilitate launchings, hauling out, and transporting on



land without the need for special equipment and trailers usually required to handle vessels of that size and weight. The vessel has living accommodations for a crew of 4 for periods of up to 2 weeks.

Shakedown trials of the new vessel were completed in Lake Michigan near Saugatuck the latter part of May after which she sailed for Mobridge, S. D., by way of Lake Michigan, Illinois-Mississippi-Missouri River Systems for most of the way. The vessel's new hauling rig was used to transport her overland the remaining 300 miles to Oahe Reservoir at Pierre, S. D.

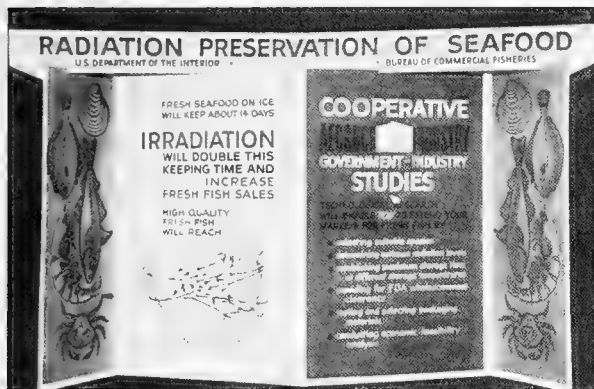
Dedication ceremonies for the Hiodon were scheduled for early June in Mobridge.



## Irradiation Preservation

### FISHERIES INDUSTRY INVITED TO JOIN STUDY OF SEAFOOD:

The Atomic Energy Commission (AEC) is seeking the cooperation of the fisheries industry in carrying out studies of radiation-processed seafood.



The Commission's Marine Products Development Irradiator, located at the Gloucester (Mass.) Technological Laboratory of the U. S. Bureau of Commercial Fisheries, will be used in the studies. The irradiator is the only one in the world expressly designed for pasteurization of fishery products. The plant was licensed by the AEC on March 17, and was fully operational on April 19, 1965. The pilot plant's radiation chamber contains a 250,000-curie cobalt-60 source which is capable of processing fishery products at the rate of 1 ton an hour.

Fishery products treated in the irradiator are still fresh, raw, and cold when they emerge from the radiation chamber. Pasteurization--reduction of bacteria--is accomplished by radiant energy. Extensive research has shown that this new, heatless pasteurization process will double or triple the shelf life of fresh fishery products. After irradiation, the fish are kept at refrigerator temperatures.

The marine products irradiator at Gloucester will be available to the fisheries industry for experimental processing of limited quantities of seafood for shipping, storage, and acceptability tests and for evaluation of the product in commercial plant and laboratory facilities. Irradiated products will not be made available for commercial use or sale to the public at this time. The information obtained will be helpful in further developing the process for future commercial application.

Commercial seafood processors and distributors interested in negotiating a cooperative agreement with the AEC at no cost should contact the Director, Division of Isotopes Development, U. S. Atomic Energy Commission, Washington, D. C. 20545.



## Maine Sardines

### CANNED STOCKS, JUNE 1, 1965:

Canners' stocks of Maine sardines on June 1, 1965, were down sharply from those of the same date in 1964 and 1963.

Final data show the 1964 pack as 865,751 standard cases (100 cans of  $3\frac{3}{4}$ -oz.) canned in 23 plants in Maine. That was much less than the 1,619,000 cases packed during 1963, but more than the 754,000 cases packed during the regular season in 1961 when fishing was extremely poor.

The new Maine sardine canning season opened on the traditional date of April 15, 1965, and the pack to July 3, 1965, totaled 265,000 standard cases, as compared with the pack to July 3, 1964, of 100,000 cases. Generally, the pack during June 1965 consisted of smaller fish which yield a high-quality pack.

The new law legalizing year-round canning of Maine sardines will remove the tra-

Canned Maine Sardines--Wholesale Distributors <sup>1</sup> and Cannery <sup>2</sup> Stocks, June 1, 1965, with Comparisons 1/													
Type	Unit	1964/65 Season				1963/64 Season				1962/63 Season			
		6/1/65	4/1/65	1/1/65	11/1/64	7/1/64	6/1/64	4/1/64	1/1/64	11/1/63	7/1/63	6/1/63	4/1/63
Distributors	1,000 actual cases	198	236	238	291	234	254	291	261	308	217	215	264
Cannery	1,000 std. cases 2/	203	314	538	629	514	499	658	1,063	1,255	643	536	699

1/ Table represents marketing season from November 1-October 31.  
2/ 100 3<sup>3</sup>/<sub>4</sub>-oz. cans equal one standard case.  
Source: U.S. Bureau of the Census, Canned Food Report, June 1, 1965.

ditional December 1 closing date for the packing season. The new legislation will open winter canning to all Maine sardine packers and will allow winter canning with domestic as well as imported herring.

Note: See Commercial Fisheries Review, July 1965 p. 27



## Michigan

### FEDERAL FUNDS REQUESTED FOR LAKE TROUT STUDY:

Michigan's Department of Conservation filed a request in May 1965 for \$40,400 in Federal funds for an extensive study on the progress of lake trout restoration work in State of Michigan waters of Lake Michigan during the 1965/66 fiscal year. Funds for the lake trout assessment study, which is planned as a continuing annual project, are being sought through the U. S. Fish and Wildlife Service under provisions of the new Commercial Fisheries Research and Development Act. Plans for undertaking this full-scale study were timed with the June 1965 initial stocking of 1.2 million marked yearling lake trout in northern waters of Lake Michigan.

As spelled out in its application for Federal funds, Michigan's Department of Conservation plans to concentrate opening investigations in that part of Lake Michigan where sea lamprey control efforts were started several years ago and where re-establishment of lake trout populations is most likely to occur first. Under the proposed project, lake studies would cover such major checkpoints as the progress of sea lamprey control, the survival of planted trout as they are affected by predation and harvests of commercial and sport fishermen, and the dispersal of those fish in Lake Michigan after they are released. Field checks will also be made to measure the growth and spawning success of planted lake trout, and their use of natural food supplies in the lake. Additional investigations will be conducted on the

relationship between lake trout and other species, and on commercial fishery statistics.

It is expected that commercial fishing for lake trout will be closed in Lake Michigan, as it has been in Lake Superior, until the rehabilitation of that species appears to be a sure thing. If so, a small number of commercial operators will be contracted to make modest catches of lake trout to collect scale and stomach samples and other needed biological information. From commercial catches, Michigan's Conservation Department would also examine lake trout for lamprey scars. This would supplement fact-finding efforts by the U. S. Bureau of Commercial Fisheries which are already under way to evaluate the status of the sea lamprey program in Lake Michigan. (News Bulletin, Michigan Department of Conservation, Lansing, May 27, 1965.)



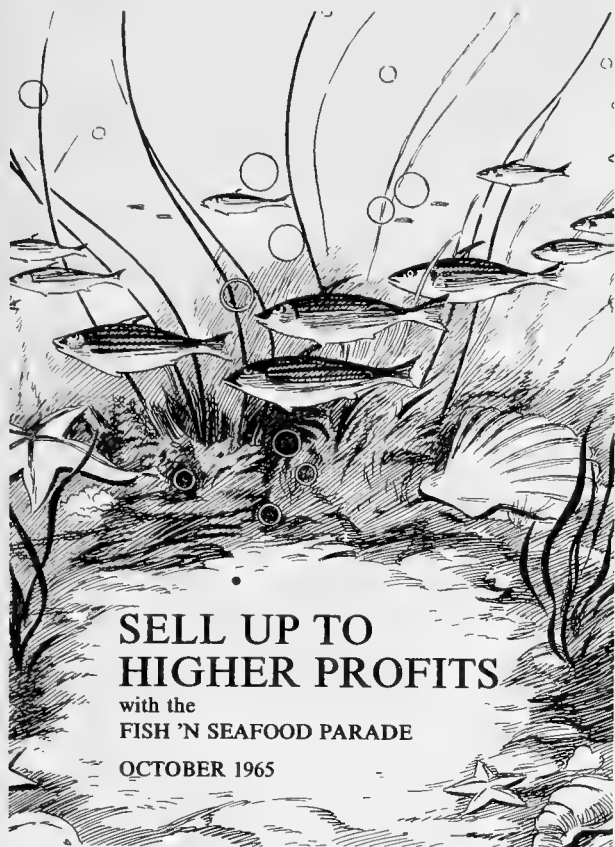
## National Fisheries Institute

SELL UP TO HIGHER PROFITS IS THEME OF 1965

"FISH 'N SEAFOOD PARADE":

Profit is the key to the fall 1965 "Fish 'n Seafood Parade" promotion, according to the chairman of the Fish 'n Seafoods Promotions Division of the National Fisheries Institute (NFI). The chairman, who is also first vice-president of NFI, said the entire program has been planned to assist retailers and mass-feeding operators to "sell up to higher profits."

The "Fish 'n Seafood Parade" promotional campaign for 1965 is three-pronged--advertising, publicity, and point-of-purchase materials--and is backed up by more industry advertising than ever before. The biggest promotion of its kind, sponsored by industry and government, will begin this summer with full-page advertisements in retail trade magazines showing that fish and sea-



## SELL UP TO HIGHER PROFITS

with the  
FISH 'N SEAFOOD PARADE

OCTOBER 1965

Motif being used for the fall 1965 "Fish 'n Seafood Parade."

food yield the greatest gross profit per square inch of freezer space--the results of a nine-year survey of Kings Super Markets of New Jersey. Other testimonial advertisements, to appear in institutional trade magazines, will feature a well-known White Plains, N.Y., restaurant, which shows a healthy profit of the seafood dishes it serves.

A full-scale publicity campaign to acquaint all buyers of foods with the "Parade" and the benefits of serving fish and seafoods--whether eaten at home or away from home--will be channeled through national and mass-feeding magazines, special-interest publications, and newspapers. Fish and shellfish cookery--ease of preparation, versatility, and nutrition--will be brought to the attention of homemakers throughout the United States through the medium of television and radio. Store displays, posters, counter cards, bar strips, and menu clip-ons all will feature beautiful underwater photography.

Area "Fish 'n Seafood Parade" committees are now being formed. Those committees are made up of industry people who will

plan local publicity and advertising promotions to tie in with the national campaign.

All promotions--both national and regional--will have the full cooperation of the U. S. Bureau of Commercial Fisheries, as in the past. The Bureau's field representatives will work closely with committees of businessmen in carrying out their regional promotion programs. Fishery bulletins and cookery leaflets distributed by the U.S. Bureau of Commercial Fisheries will feature the economy and easy availability of fishery products.

Note: Merchandising materials for the promotional campaign may be obtained through seafood packers and processors, or by buying them direct from the Fish 'n Seafoods Promotions Division, National Fisheries Institute, 1614 20th Street NW., Washington, D. C. 20009.



## North Atlantic

### SOVIET FISHING ACTIVITY OFF COAST, JUNE 1965:

Soviet fishing activity in the Northwest Atlantic increased substantially during June 1965. A total of 178 vessels were sighted and identified as 48 factoryship stern trawlers, 116 refrigerated and nonrefrigerated side trawlers, 10 processing and refrigerated fish transports, 3 base ships, and one fuel and water carrier. This compared with an estimated 125 vessels sighted in May and 120 vessels in June 1964.



Fig. 1 - Large Soviet factory stern trawler of the "Tropik" class in the North Atlantic.

The larger number of vessels in June was attributed to the deployment of some 60 vessels of the SRT and SRTR classes from the Sable Island area to Georges Bank. It was believed the lack of fish in the former area prompted the move.

Soviet fishing operations during the month generally ranged from south of Martha's Vineyard eastward along the 100-fathom curve of the Continental Shelf to the south-

west and southeast parts of Georges Bank--120 to 175 miles southeast and east of Cape Cod.



Fig. 2 - Soviet refrigerated fish transport operating in Northwest Atlantic.

Although most of the vessels appeared actively engaged in fishing operations, only moderate catches of predominantly whiting and lesser quantities of herring were observed being taken. Toward the end of the month a fleet of Soviet vessels was sighted 40 miles south of Martha's Vineyard. That area is generally regarded productive for whiting about that time of year. United States fishermen reported good catches about 25 miles north of that area.



Fig. 3 - Soviet fishery base ship in Northwest Atlantic.

There were no reports during the month of Soviet fishing activity along the middle Atlantic Coast areas. Information received indicated that about 20 Soviet vessels fished those areas in May. In May 1964 a total of 14 Soviet SRT's and SRTR's were sighted off the North Carolina coast.

Note: See Commercial Fisheries Review, July 1965 p. 30.



## North Atlantic Fisheries Investigations

### HERRING AND LOBSTER OFFSHORE POPULATION STUDIES CONTINUED:

M/V "Albatross IV" Cruise 65-8 (June 8-18, 1965): Biological investigations related to offshore populations of herring and lobsters were conducted during this cruise in

the North Atlantic Ocean (general area of Georges Bank) by the U. S. Bureau of Commercial Fisheries research vessel Albatross IV. The objectives were to (1) sample populations of sea herring and lobsters and obtain related environmental data; (2) obtain sea herring and lobster blood samples; and (3) make plankton tows for herring and lobster larvae.

**FISHING OPERATIONS: Herring:** Seven herring trawl sets were made at the stations covered. The sets (1 hour duration) made in waters of 30 to 45 fathoms yielded a total of 204 bushels (15,000 pounds) of herring. About 75 percent of the herring caught were from the northern part of Georges Bank, 23 percent were from south of the southeast part of the Bank, and 2 percent from the southeast part of the Bank and east of the southeast part of the Bank. The herring were from 23.5 to 33.9 centimeters (9.3 to 13.3 inches) long. The 1960 year-class was dominant in the catches followed in percentage occurrence by the 1961 and 1962 year-classes. Approximately 200 herring blood samples were obtained and stored for future analysis. The herring taken in a lobster tow were caught at a depth of 75 fathoms, and were from 31.0 to 34.8 centimeters (about 12.2 to 13.7 inches) long. Preliminary examination showed that the majority of fish in the sample were from the 1958 and 1957 year-classes.

**Lobster:** A total of 30 trawl sets were made at the 7 lobster stations worked. The sets made in depths ranging from 65 to 250 fathoms yielded 397 lobsters--239 females, and 158 males. Of the females, 143 were berried (egg-bearing), and half of them had ripe eggs. Three of the females were spent. The mean weight of the catch was around 5 pounds and ranged in weight from  $\frac{1}{4}$  to 16 pounds. Some 200 lobster blood samples were taken for future analysis. At Veatch's Canyon on Georges Bank, lobsters were concentrated west of the Canyon at 150 to 250 fathoms. At Corsair Canyon, lobsters were concentrated southwest of the Canyon at 65 to 100 fathoms.

**PLANKTON OPERATIONS: Herring:** A total of 28 one-meter net plankton tows of 15 minutes duration (5 minutes each at depths of 32.8 feet, 16.4 feet, and at the surface) were made during the cruise. **Lobster:** Eight 1-meter net plankton tows lasting 15 minutes each (at the surface) were made.

**HYDROGRAPHIC OBSERVATIONS:** Five sea-bed drifters and 5 drift bottles were released at each of the plankton tow stations. At each station, bathythermograph (BT) casts were made; surface, mid-depth, and bottom salinity samples collected; and weather observations recorded. Surface and bottom temperatures were taken and recorded.

Note: See Commercial Fisheries Review, July 1965 p. 35.

\* \* \* \* \*

#### CONTINENTAL SHELF WATERS SURVEYED:

M/V "Albatross IV" Cruise 65-7 (May 19-June 3, 1965): To conduct an environmental survey of Continental Shelf waters in an area bounded by longitudes  $64^{\circ}30'$  W. and  $72^{\circ}30'$  W. was the purpose of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Albatross IV.

A total of 76 hydrographic stations was occupied throughout the cruise area. Water samples were obtained at various depths up to 250 meters (820 feet) for the determination of salinity, dissolved oxygen, and chlorophyll. Also, 228 bathythermograph casts were made for the determination of temperature. In addition, 24 hydrographic stations were occupied at 2-hour intervals at a moored buoy and at a floating buoy moored with a parachute drogue to determine the temporal fluctuations of these properties, and of zooplankton biomass due to tidal oscillations and internal waves.

The Albatross IV was scheduled for another cruise on June 8 to the vicinity of Georges Bank in the North Atlantic to study the distribution of sea herring and lobsters in relation to their environment.

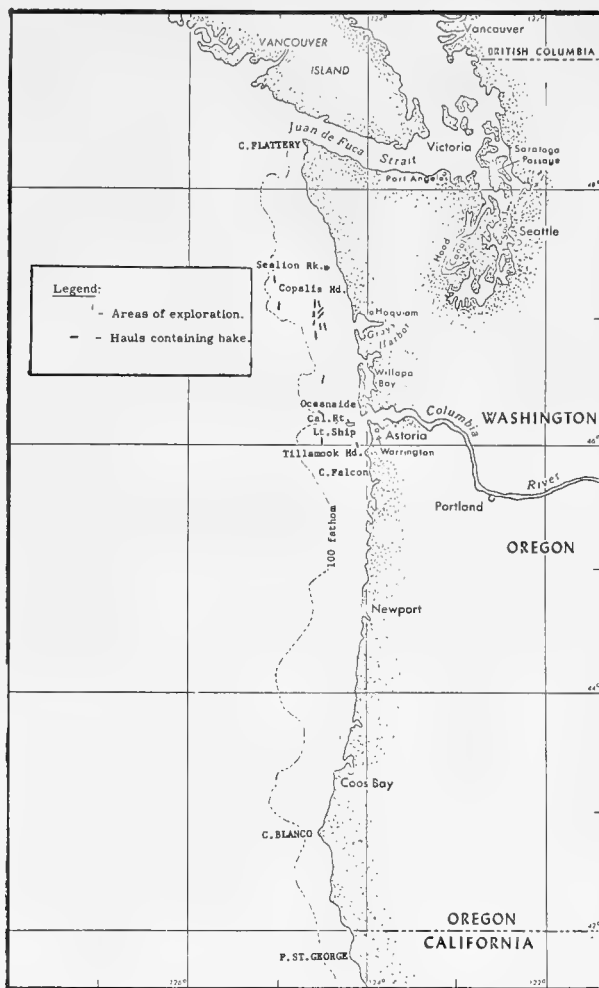
Note: See Commercial Fisheries Review, July 1965 p. 35; February 1965 p. 35.



### North Pacific Fisheries Explorations and Gear Development

#### HAKE POPULATION SURVEY CONTINUED:

M/V "John N. Cobb" Cruise 71 (April 1-May 27, 1965): Explorations for Pacific hake (Merluccius productus) along the Pacific coast from Cape Flattery, Wash., to Pt. St. George, Calif., and in selected areas of Puget Sound were conducted during this cruise by



Shows areas of exploration during M/V John N. Cobb Cruise 71 (April 1-May 27, 1965).

the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb.

Principal objective of the cruise was to determine when and where Pacific hake schools appear off the coasts of Washington and Oregon in the spring. Secondary objectives were to obtain: (1) further information on the seasonal availability of Pacific hake in Puget Sound waters; (2) additional data relative to the catching efficiency of the "Cobb" pelagic trawl, and (3) biological data on Pacific hake, such as degree of maturity, size and sex composition of catches, and the presence or absence of hake larvae and eggs.

**GEAR USED:** The principal gear used during the explorations was a Mark II "Cobb" pelagic trawl constructed of 3-inch mesh monofilament webbing. A three-quarter

length cod-end liner of one-half-inch mesh was used during most of the drags so as to retain small organisms. A smaller version of the Mark II pelagic trawl was used during the latter part of the cruise. It is constructed of 2-inch mesh multistrand webbing and is about two-thirds the size of the Mark II pelagic trawl. Both trawls were fished with two aluminum hydrofoil-type otter boards and 60-fathom bridles. Fishing depth of the net was determined using a dual electrical depth telemetering system having a depth-sensing unit housed at the terminus of each cable. A high-resolution, low-frequency echosounder was used to locate fish schools. Other gear used included a one-meter plankton net and a bathythermograph.

**METHODS OF OPERATION:** Echo-sounding transects were run in an onshore-offshore direction at oblique angles to the coast from the 30-fathom contour to depths of 200 fathoms or greater. When fish traces were observed, closely spaced echo-sounding transects coupled with pelagic trawl hauls were made to determine the size of the schools. Length frequency, maturity, and sex ratio data were obtained from random samples of 100 to 200 hake from each catch. Cursory examination of hake stomachs was made to determine types of food organisms. A bathythermograph (BT) cast was made after each pelagic trawl haul, and plankton tows were made at selected localities.

**COASTAL EXPLORATIONS:** During the first part of cruise (April 1-19), sounding transects were made from Point St. George to Cape Flattery. Heavy echo traces suggestive of Pacific hake were observed off St. George reef, Calif., on April 4 and off Oceanside, Wash., on April 15. The fish traces off St. George reef were at a depth of 24 fathoms over a bottom depth of 44 fathoms. Sea lions were observed in the vicinity feeding on what appeared to be hake. The pelagic trawl could not be fished because of large northwest swells. Fish traces observed off Oceanside were over bottom depths of 35 to 45 fathoms. A half-hour pelagic trawl haul was made on those traces, but no hake were caught. The catch consisted mainly of about 350 pounds of anchovies (*Engraulis mordax*) and 80 pounds of yellowtail rockfish (*Sebastes flavidus*). Only two other hauls were made during the period, both of them off Cascade Head, Oreg. Neither haul yielded any hake.

During the latter part of the cruise (May 6-25), sounding transects were made from Cape Flattery to Cape Falcon, Oreg. Hake schools were first encountered off Grays Harbor and Copalis Head on May 7. The schools were not heavily concentrated, being scattered in isolated aggregations from about the 40-fathom contour to the edge of the Continental Shelf, with most frequent occurrences between the 45-60-fathom contours. Five hauls made in the vicinity of Copalis Head and Grays Harbor yielded from 152 pounds to 29,290 pounds of hake per hour of trawling. The 152-pound catch also contained 4,000 pounds of anchovies, 1,000 pounds of herring, and 2,000 pounds of yellowtail rockfish. Sounding transects southward of Grays Harbor located hake schools north of the Astoria Canyon, over the eastern edge of the Canyon, southwest of the Columbia River lightship and off Tillamook Head. The school north of Astoria Canyon was concentrated in a narrow band over bottom depths between 66-70 fathoms, and extended in a north-south direction for about 5 miles. A half-hour haul made on that school yielded a 6,150-pound catch, of which 6,000 pounds were hake.



Fig. 2 - A good catch of hake using the "Cobb" pelagic trawl.

The schools over the Astoria Canyon and southwest of the Columbia River lightship were small and produced light to moderate echo traces. The school off Tillamook Head extended over a bottom depth interval of 45 to 68 fathoms and was about 20 fathoms off the bottom. Its north-south extent was not defined. A half-hour haul with the smaller pelagic trawl made on that school yielded 5,000 pounds, consisting almost entirely of hake.



Sounding transects were continued in the vicinity of Willapa Bay and Grays Harbor during May 17-25. Eight hauls made during that period yielded from 400 to 48,000 pounds of hake per hour of pelagic trawling. The 400-pound catch was made off Sealion Rock, the most northern limit where hake were found. The 48,000-pound haul was made off Grays Harbor over bottom depths of 52-55 fathoms on the heaviest echo traces observed during the cruise.

No hake were encountered off Washington and Oregon from April 1 to 19. During the latter part of cruise (May 7-25), hake were taken as far north as Sealion Rock.

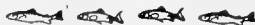
**EXPLORATIONS IN PUGET SOUND:** Pacific hake were found in northern Puget Sound, Hood Canal, and Saratoga Passage. Two of 5 hauls of one-half hour duration made in northern Puget Sound accounted for catches of 2,500 and 5,500 pounds of hake. The remaining 3 hauls in northern Puget Sound were made to test the fishing and telemetry gear. Two drags were made in Saratoga Passage; 1 drag was for test purposes and the other yielded 150 pounds of hake. Two half-hour hauls in Hoods Canal yielded 2,500 and 3,500 pounds of hake.

**FISH SIZE, MATURITY, AND STOMACH CONTENTS:** Samples of hake taken in Puget Sound were smaller than those caught off Washington and Oregon. Puget Sound hake ranged in size from 7 to 68 centimeters (2.8 to 26.8 inches) and their size composition showed three distinct modes--4.7, 9.8, and 14.2 inches. Hake taken off Washington ranged in size from 40 to 68 centimeters (15.7 to 26.8 inches) with a mode at 53 centimeters (20.9 inches). Those off Oregon and the Columbia River entrance ranged in size from 40 to 77 centimeters (15.7 to 30.3 inches) with a mode at 50 centimeters (19.7 inches).

**OTHER ACTIVITIES AND OBSERVATIONS:** In cooperation with the Bureau's Seattle Technological Laboratory, hake were delivered to several reduction plants for meal- and oil-yield tests and to a processing plant for fillet studies.

Pacific lamprey (*Entosphenus tridentatus*) were taken in several catches off Oregon and Washington. Several hake were found with serious lamprey-inflicted wounds, which had penetrated the peritoneum.

Note: See *Commercial Fisheries Review*, May 1965 p. 27.



## Oceanography

### OCEAN SCIENCE AND ENGINEERING CONFERENCE AND EXHIBIT AT WASHINGTON, D. C.:

An Ocean Science and Ocean Engineering Conference and Exhibit was held June 14-17, 1965, at Washington, D. C. Six different symposia of both a general and specialized nature were given. Perspectives in ocean engineering, underwater vehicles, atomic energy uses in the ocean, marine mineral resources, results of the U. S. biology program in the International Indian Ocean Expedition, and distribution of Columbia River water in the North Pacific were discussed. The first three symposia cut across specialized interests and presented information useful to several scientific and engineering disciplines.

The symposium "Perspectives in Ocean Engineering" was held on June 17, with Professor John Isaacs of the Scripps Institution of Oceanography and D. S. Potter of the General Motors Defense Research Laboratories as chairmen. It discussed several fields of ocean engineering that require generalized development at this time. Major topics were motion in the sea, remote sensing, and mechanical properties of sediments. Advances in those fields are considered necessary at this time and would be of benefit to military, scientific, and commercial ocean interests.

The symposium on underwater vehicles on June 16 encompassed three topics: (1) present design and operational parameters involved in existing underwater vehicles; (2) future vehicles, both manned and unmanned, and their design concepts; and (3) materials now used in the construction of underwater vehicles and those likely to be used in the future.

A special symposium called "Nuclear Power for use in the Ocean" was sponsored jointly by the Atomic Industrial Forum and the Marine Technology Society. Held on June 17, it was devoted to existing and potential uses of nuclear power from the points of view of requirements and capabilities. Power sources for deep submergence and industrial applications of nuclear power for the extraction of oil and minerals were discussed.

The Conference and Exhibit was co-sponsored by the Marine Technology Society and

the American Society of Limnology and Oceanography, and also included sessions of contributed papers and special panels and addresses.

Note: See Commercial Fisheries Review, May 1965 p. 30; Mar. 1965 p. 45.

\* \* \* \* \*

#### PLANS FOR NUCLEAR-POWERED RESEARCH SUBMARINE STUDIED BY INTERIOR DEPARTMENT:

A study sponsored by the U. S. Bureau of Commercial Fisheries shows that it is feasible to build a specially designed nuclear-powered submarine for fishery and oceanographic research, said Secretary of the Interior Stewart L. Udall, June 17, 1965. The study was conducted by a firm noted as the pioneer submarine designer and builder that developed the nuclear submarines Nautilus, Skipjack, George Washington, and others.

United States scientists have long desired an oceanographic underseas craft of a speed, range, and maneuverability that only a nuclear craft possesses, the Interior Secretary noted. Such a submarine could study fish behavior, distribution of resources, disposal of atomic wastes, water temperatures, salinity, and many other oceanographic problems that are now approached mostly by means of instruments lowered from the deck of a ship. The Soviet Union has used a converted military submarine in fishery studies for several years, but the conventional underseas craft lacks speed, maneuverability, and many scientific advances that an atomic submarine could have.

According to the preliminary study by the submarine designing contractor, the new research vessel would be 163 feet long, 23 feet in diameter, and carry a crew of 24, plus 7 scientists. It would be able to operate at depths as great as 1,000 feet and while submerged be capable of 20 knots, a speed at which some of the swifter tuna swim. Fishery scientists believe most of the great fishery resources are located in the layer between the surface and a depth of approximately 1,000 feet. Throughout that range they would be able to observe fish and other marine organisms in their natural environment and collect samples at known depths. Such knowledge would permit man to undertake more sophisticated approaches to harvesting the resources of the sea.

Among scientific advances contained by the atomic vessel would be an observation sphere in the bow, remote controlled television cameras for areas not visible from the bow, and a complex system of sampling instruments providing oceanographic data to a computer aboard the vessel. One of the principal advantages of an atomic craft, in addition to its advanced scientific equipment, said Donald L. McKernan, Director of the Bureau of Commercial Fisheries, would be its capability of making continuous scientific observations under sea conditions too rough for most surface oceanographic vessels, especially during the winter.

The research submarine would cost an estimated \$25 million. The Bureau Director said that while the cost may seem high, "bold new approaches to scientific problems, such as this type of vessel represents, are necessary if the United States' share of the world's fisheries is to be increased." He added that the National Academy of Sciences' Committee on Oceanography estimated that the present contribution of United States fisheries to the Gross National Product is \$1 billion annually. He said the Committee also predicted that the \$1 billion figure could be tripled in 10 years if ocean research were conducted on a sufficiently broad scale. And he pointed out that this does not include other scientific contributions which would result from the broad scale oceanographic research to be undertaken by an atomic submarine. Director McKernan said he has asked the National Academy of Sciences to set up a special committee to assess various aspects of the study and to advise the Bureau how best to proceed.

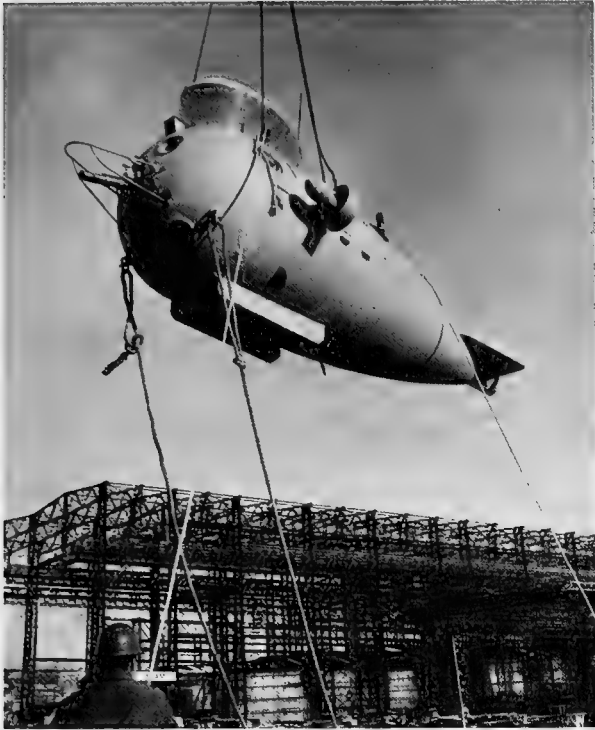
Note: See Commercial Fisheries Review, May 1963 p. 35.

\* \* \* \* \*

#### SUBMARINE USED TO EXPLORE SEA FLOOR OFF RHODE ISLAND:

University of Rhode Island scientists were scheduled to explore the sea floor of Narragansett Bay and Block Island Sound for a 12-day period starting June 2, 1965, using a 2 man submarine named for the Phoenician goddess Asherah.

Capable of descending to a maximum depth of 600 feet and moving at speeds up to 4 knots, the electric-powered submarine was constructed by a private firm for the University of Pennsylvania Museum which, in cooperation with the National Geographic Society, used the vehicle for underwater



A 2-man electric submarine explores the sea floor off Rhode Island.

archeological exploration in the Aegean Sea off the Turkish coast in the summer of 1964.

The associate professor of geological oceanography who conceived the Rhode Island project said he wanted to explore the underwater hills, valleys, and other "topographic" features off the Rhode Island coast. He was particularly interested in the area from Castle Hill north in the East Passage. "There's a deep valley here nearly 200 feet deep. It is unusual in that it's fairly deep, yet close to land," he explained. He also hoped to learn something about the actions of physical and biological agents on the bottom itself. In addition to direct observations, he planned to make a photographic and audio-tape record of bottom features.

His activities, including the costs of services for the submarine, its support equipment, and its personnel, are covered by contracts with the Office of Naval Research.

If submersibles prove to be a useful tool in his work, he said he may take advantage of an opportunity in 1966 to use a submarine capable of going to depths of several thousand feet.

Another Rhode Island oceanographer was scheduled to spend 2 days in Block Island and Long Island Sounds attempting to survey the density and locations of plants in depths up to 140 feet. His work is supported by the National Institutes of Health. If scientists can learn more about underwater plant growth, sewage and other organic materials draining into coastal areas might be handled to re-enrich the water instead of polluting it. The wastes would then serve as a sort of marine fertilizer promoting the growth of desirable marine plants and indirectly providing food for various marine organisms.

Throughout the operations the 41-foot workboat Billie II was to act as a tender and tug, carrying necessary support equipment. An observer-maintenance man, was to remain on the surface in continuous communication with the submarine.

The submarine has six viewports, which allow observation forward, downward, and to the sides. In addition, a plexiglass free-flooding "bubble" above the main hatch provides 270-degree visibility when the vessel is on the surface and protects the hatch area so that personnel may be transferred while afloat.

Driven by two side-mounted rotatable electric propulsion pods (two horsepower each), the vehicle can move in all directions. Commenting on its ability to hover, the University of Pennsylvania Museum said in a publication that the vehicle "Maneuvered like a helicopter." It is 17 feet long, weighs 8,500 pounds, and is capable of operating underwater for 10 hours under normal conditions. However, it is equipped with an air rebreathing and oxygen system sufficient to maintain the operator and observer for 24 hours, if necessary. (University of Rhode Island, May 28, 1965.)



## Retail Prices

### FISHERY PRODUCTS RETAIL PRICE INDEXES, 1963-65:

The U. S. retail price index for fishery products in 1964 was at 107.4 percent of the 1957-59 average, as computed by the Bureau of Labor Statistics, U. S. Department of Labor. Compared with the 1963 index of 110.0 percent, retail prices for fishery products in 1964 were down 3.2 percent.

Based on an average price index of 109.8 in the first quarter of 1965, retail prices for fishery products were down 1.7 percent from the same quarter in 1964. (National Food Situation, NFS-112, May 1965, U. S. Department of Agriculture.)

Note: Indexes revised by Bureau of Labor Statistics beginning January 1964. Item selection and quantity weights for foods covered (including fishery products) in Retail Food Price Indexes and Consumer Price Index reflect the buying pattern of wage earners and clerical workers in 1960-61 and for the first time include single person families. Series are linked at December 1963.

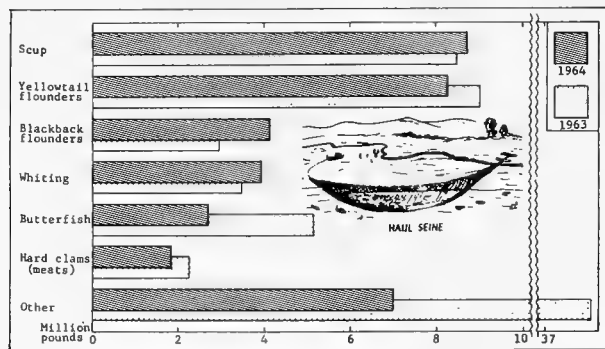


## Rhode Island

### FISHERY LANDINGS, 1964:

Landings of fish and shellfish at Rhode Island ports during 1964 were 36.4 million pounds valued at \$3.6 million. Compared with 1963, this was a drop of 32.9 million pounds and \$507,000. The catch used for food was down 2.7 million; and that for industrial purposes, principally fish meal, dropped 30.2 million pounds.

During 1964, scup led all edible items with 8.7 million pounds. Yellowtail and blackback flounders were next with 8.2 and 4.1 million pounds, respectively. Whiting was third with 3.9 million pounds, followed by butterfish with 2.7 million pounds, and hard clams with 1.8 million pounds of meats. Eighty-one percent of the year's total was made up of these 6 varieties of fish and shellfish.



Rhode Island landings, 1964 and 1963.

The majority of the 1964 catch was taken by otter trawlers--25.2 million pounds or 69 percent of the year's total. Floating traps took 8.8 million pounds or 24 percent, tongs and rakes took 1.5 million pounds or 4 percent, and various other types of gear caught 900,000 pounds or 3 percent.

May landings of 8.1 million pounds were highest--68 percent was scup, or 5.5 million pounds. June was second in production with 4.6 million pounds, and July third with 3.5 million pounds.



## Salmon

### U. S. PACIFIC COAST

#### CANNED STOCKS, JUNE 1, 1965:

On June 1, 1965, canners' stocks in the United States of Pacific canned salmon totaled 951,644 standard cases (48 1-lb. cans), 199,236 cases less than on May 1, 1965, when stocks were 284,865 cases less than on April 1, 1965.

On the basis of a total of 1,131,940 actual cases (consisting of cans of  $\frac{1}{4}$ -lb.,  $\frac{1}{2}$ -lb., 1-lb., etc.), pink salmon accounted for 45.6 percent (515,796 cases of which 416,225 cases were 1-lb. talls) of the total canners' stocks on June 1, 1965. Next came chum (331,956 cases, mostly 1-lb. talls), followed by red (180,128 cases). The remainder of about 9.2 percent was coho (silver) and king salmon. Pink salmon stocks on hand packed in 48 1-lb. cans accounted for 80.7 percent of the total pink salmon stocks as of June 1, 1965, with the balance mostly in 48  $\frac{1}{2}$ -lb. cans.

Table 1 - Total Canners' Stocks of Pacific Canned Salmon, June 1, 1965			
Species	June 1, 1965	May 1, 1965	Apr. 1, 1965
. . . . . (No. of Actual Cases). . . . .			
King	30,336	39,645	46,882
Red	180,128	227,847	299,277
Coho	73,724	87,255	102,233
Pink	515,796	654,421	849,663
Chum	331,956	373,892	428,803
Total	1,131,940	1,383,060	1,726,858

From May 1 to June 1, 1965, pink salmon stocks were lower by 138,625 actual cases (1-lb. talls lower by 103,218 cases); reds were down 47,719 cases, and chums were down 41,936 cases.

Carryover stocks at the canners' level totaled 1,175,588 standard cases on July 1, 1964, the approximate opening date of the Pacific salmon packing season. Adding the new season pack of 3,992,356 standard cases brought the total available supply for the 1964/65 season to 5,097,944 standard cases.

Table 2 - Total Cannery Stocks on Hand June 1, 1965 (Sold and Unsold), by Species and Can Size

Case & Can Size	King	Red	Coho	Pink	Chum	Total
(Actual Cases)						
48 $\frac{1}{4}$ -lb. ....	2,599	42,630	14,309	1,870	21	61,429
48 $\frac{1}{2}$ -lb. ....	24,154	101,383	13,403	92,327	37,182	268,449
48 1-lb. ....	3,496	36,092	43,935	416,225	284,073	783,821
12 4-lb. ....	87	23	2,077	5,374	10,680	18,241
Total .....	30,336	180,128	73,724	515,796	331,956	1,131,940

Table 3 - Cannery Shipments from July 1, 1964 to June 1, 1965, by Species and Can Size

Case & Can Size	King	Red	Coho	Pink	Chum	Total
(Actual Cases)						
48 $\frac{1}{4}$ -lb. ....	21,648	385,302	108,383	9,811	1,423	526,567
48 $\frac{1}{2}$ -lb. ....	112,688	585,711	40,972	511,141	120,909	1,371,421
48 1-lb. ....	18,625	461,962	124,574	1,981,699	594,534	3,181,394
12 4-lb. ....	329	4,927	19,413	94,023	28,862	147,554
Total .....	153,290	1,437,902	293,342	2,596,674	745,728	5,226,936

Shipments during May 1965 totaled 199,236 standard cases. Shipments at the cannery level of all salmon species from July 1, 1964, to June 1, 1965, totaled 4,146,300 standard cases.

The new 1965 season Alaska salmon pack totaled 103,755 standard cases as of June 20, 1965. This compared with 65,650 cases on June 21, 1964. Most of the new pack consisted of red and king salmon packed at canneries in central and western Alaska.

Data on canned salmon stocks are based on reports from U. S. Pacific Coast canners who packed over 96 percent of the 1964 salmon pack. (Division of Statistics and Economics, National Cannery Association, June 29, 1965.)

Based on data submitted to the U. S. Bureau of the Census by a sample of wholesalers and warehouses of retail multiunit organizations, distributors stocks of salmon, measured in the survey for the first time, were estimated at 671,000 actual cases on June 1, 1965.



## Shrimp

### U. S. PRODUCTION OF MANUFACTURED SHRIMP PRODUCTS, 1964:

The United States production of frozen breaded (raw and cooked) shrimp in 1964



Fig. 1 - Packing heads-off fresh shrimp in consumer packages for freezing in a Florida plant.



Fig. 2 - Breeding peeled and deveined shrimp at a Tampa, Fla., shrimp-processing plant. This method of processing shrimp for the convenience of the consumer has increased in importance in recent years.



Fig. 3 - Conveyor belt transports shrimp to weighing and packing line.

U. S. Production of Manufactured Shrimp Products, 1954-1964									
Year	Fresh and Frozen								
	Raw, Headless		Peeled, Raw (Including Deveined)		Cooked (Including Peeled & Deveined)				
	1,000 Lbs.	\$1,000	1,000 Lbs.	\$1,000	1,000 Lbs.	\$1,000			
1964...	1/	1/	1/	1/	1/	1/			
1963...	66,441	47,687	22,155	25,711	2,322	3,750			
1962...	51,177	47,214	18,129	22,032	3,139	5,401			
1961...	46,417	35,262	17,236	18,303	2,593	4,021			
1960...	78,071	47,636	19,287	18,500	2,871	4,281			
1959...	61,598	36,980	11,096	9,945	1,891	2,816			
1958...	63,276	48,214	7,622	8,450	2,080	3,405			
1957...	58,269	45,070	9,375	9,952	1,444	2,488			
1956...	61,355	42,633	7,512	7,304	2,237	3,101			
1955...	69,122	39,690	6,745	5,895	1,758	1,798			
1954...	82,416	43,115	4,156	2,605	1,607	2,056			
Year	Breaded (Raw and Cooked)		Specialties (Soups, Stews, Sticks, etc.)		Total Fresh and Frozen				
	1,000 Lbs.	\$1,000	1,000 Lbs.	\$1,000	1,000 Lbs.	\$1,000			
1964 2/...	90,678	63,041	1/	1/	172,235	134,826			
1963...	76,216	53,527	5,101	4,151	154,761	141,460			
1962...	76,803	62,230	5,514	4,583	145,783	117,088			
1961...	73,795	55,089	5,743	4,413	176,405	121,534			
1960...	70,348	47,015	5,829	4,102	147,985	97,748			
1959...	69,764	45,314	3,635	2,693	137,507	106,628			
1958...	60,865	43,622	3,664	2,938	123,727	98,133			
1957...	51,085	37,764	3,555	2,858	124,899	92,027			
1956...	50,888	37,301	2,907	1,688	118,274	75,543			
1955...	38,991	26,907	1,657	1,252	113,504	65,814			
1954...	24,802	17,579	524	460					
Year	Canned (Drained Weight)		Specialties (Soups, Stews, etc.)		Sun-dried				
	1,000 Lbs.	\$1,000	1,000 Lbs.	\$1,000	1,000 Lbs.	\$1,000			
1964 2/...	9,740	12,917	587	246	454	380			
1963...	15,904	19,531	423	201	372	598			
1962...	13,249	18,973	264	172	418	745			
1961...	9,284	11,742	289	120	710	796			
1960...	14,268	17,233	201	61	322	291			
1959...	13,832	16,948	178	51	349	494			
1958...	14,308	20,791	246	94	347	561			
1957...	9,120	13,136	394	159	471	607			
1956...	13,636	16,421	571	336	498	416			
1955...	13,516	13,562	287	116	985	597			
1954...	14,021	13,691	305	101					
Year	Cured (Salted, Pickled and Smoked)		Meal and Bran		Grand Total				
	1,000 Lbs.	\$1,000	1,000 Lbs.	\$1,000	1,000 Lbs.	\$1,000			
1964 2/...	1/	1/	754	15	154,954				
1963...	1/	1/	494	16	161,219				
1962...	1/	1/	596	17	129,706				
1961...	-	-	592	11	139,634				
1960...	1/	1/	358	10	115,101				
1959...	12	24	1,254	39	128,129				
1958...	57	92	808	23	112,115				
1957...	76	102	1,122	34	109,482				
1956...	37	56	1,036	34	89,746				
1955...	69	74	1,770	51	80,268				
1954...	6	14							

1/ Data not available.  
2/ Preliminary.

amounted to 90.7 million pounds valued at a little more than \$63 million. This was an increase of 19.0 percent in quantity and 17.8 percent in value as compared with 1963. The canned shrimp pack (drained weight) for 1964 dropped sharply, however, to 9.7 million pounds valued at \$12.9 million--down 38.8 percent in quantity and 33.9 percent in value from 1963. There was some increase over the previous year in the 1964 production of shrimp specialties (soups, stews, etc.).



## Shrimp Association of the Americas

### CONVENTION HELD AT MIAMI BEACH IN JUNE 1965:

A convention was held in Miami Beach, Fla., June 20-23, 1965, jointly by the Shrimp Association of the Americas and the South-eastern Fisheries Association.

The General Session of the Convention on June 21 opened with an inaugural address by the U. S. Assistant Secretary of the Interior for Fish and Wildlife. The Session also included the following talks: "Marketing Seafood at the National Level and Highlights of the Joint Marketing Program in Florida"; "What's Going on in the Latin America Area"; and "Use of Radiotelephones by Fishing Vessels."

One of the highlights of the General Session on June 22 was a talk on the "SAOTA Advertising and Promotion Program," by the Publicity Director of the National Fisheries Institute, Washington, D. C.

The General Session on June 23, featured talks by scientists on subjects of general interest including: "A Scientific Basis for Extending the Grade 'A' Life of Fresh Iced Shrimp"; "A Proposed Program for Retaining Seafood Quality During Processing, Packing, and Distribution"; "Resume of Marine Biology Research in Mexico"; and "A Mid-Year Review of the Situation and Outlook for Shrimp." The Session also featured a "Report on Congress--Fishery Legislation" by the Director of the Fishery Products Program, National Canners Association, Washington, D. C.





## States' Legislation

### ACTIONS AFFECTING FISHERIES:

Following is a list of 1965 State laws and resolutions passed by the State Legislatures which have already adjourned for the year. Additional legislation will be reported as sessions end in other States. (Information Letter, National Cannery Association, June 5, 1965.)

Alaska: S. 1 requires that a primary buyer "shall purchase raw fish by the pound."

S. 112 relates to the stabilization, maintenance, quality control, and development of the shellfish industry of the State. It also creates the Alaska Shellfish Marketing and Quality Control Advisory Board and provides for an assessment on shellfish processors in the State to finance the Act.

S. J. R. 46 calls for a national Department of Fisheries in the Executive Branch of the Federal Government.

S. J. R. 48 requests full appropriation support for the Commercial Fisheries Research and Development Act of 1964.

Maryland: H. 32 requires licensing of certain persons engaged in the business of buying oysters from persons taking or catching oysters; also requires licenses for certain oyster boats, vessels, and vehicles; fixes the terms and fees of such licenses; and changes license fees for the taking of oysters by tonging or dredging.

S. 464 changes laws on issuing and suspending licenses of canneries and frozen food-processing plants.

S. J. R. 32 requests the Governor to appoint a commission to study problems of the oyster industry in order to insure its survival and growth.



## Tuna

### FIRST PACIFIC ALBACORE OF 1965 SEASON CAUGHT OFF CALIFORNIA:

The first albacore tuna of the 1965 Pacific season were caught off southern California by the U. S. Bureau of Commercial Fisheries chartered vessel Native Sun. The vessel caught 2 albacore on June 20 and another 2 on

the 21st. The catches were made at 30°41' North latitude and 121°02' West longitude, about 60 miles WNW. of Showboat Bank in a water temperature of 61.3° F.

Another chartered vessel, the Tuna Clipper, operating on June 20 at 32°18' North latitude and 121°25' West longitude in a water temperature of 59.5° F., made no catches.

Later, a U. S. Navy picket vessel was reported to have caught 2 albacore on each day during June 25-27, west of Cape Mendocino off the Northern California coast in water temperatures of 60°-62° F., at 40°30' North latitude and 133°30' West longitude. The fish were said to range from 16 to 20 pounds each.



## U. S. Fishing Vessels

### DOCUMENTS ISSUED AND CANCELLED:

January 1965: During January 1965 a total of 26 vessels of 5 net tons and over was issued first documents as fishing craft as compared with 33 in January 1964. There were 27 documents cancelled for fishing vessels in January 1965 as compared with 32 in January 1964.

Table 1 - U. S. Fishing Vessels<sup>1/-</sup>--Documentations Issued and Cancelled, by Areas, January 1965 with Comparisons

Area (Home Port)	January		Total 1964
	1965	1964	
. . . . (Number). . . .			
<u>Issued first documents 2/:</u>			
New England . . . . .	3	1	33
Middle Atlantic . . . . .	1	1	11
Chesapeake . . . . .	4	5	39
South Atlantic. . . . .	3	5	50
Gulf . . . . .	9	17	221
Pacific . . . . .	6	3	141
Great Lakes . . . . .	-	1	4
Hawaii . . . . .	-	-	2
Puerto Rico . . . . .	-	-	2
Total . . . . .	26	33	503
<u>Removed from documentation 3/:</u>			
New England . . . . .	1	1	53
Middle Atlantic . . . . .	1	2	27
Chesapeake . . . . .	1	4	29
South Atlantic . . . . .	7	4	62
Gulf . . . . .	6	9	106
Pacific . . . . .	8	7	151
Great Lakes . . . . .	2	5	14
Hawaii . . . . .	1	-	-
Total . . . . .	27	32	442

<sup>1/</sup>Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.

<sup>2/</sup>There were 2 redocumented vessels in January 1965 previously removed from the records. Vessels issued first documents as fishing craft were built: 6 in 1965; 11 in 1964; 1 in 1963; 1 in 1962; 1 in 1959; 1 in 1958; and 5 prior to 1951.

<sup>3/</sup>Includes vessels reported lost, abandoned, forfeited, sold, alien, etc.

Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.

Table 2 - U.S. Fishing Vessels--Documents Issued by Vessel Length and Area, January 1965 1/

Length in feet	New England	Middle Atlantic	Chesapeake	South Atlantic	Gulf	Pacific	Total
(Number)							
28	-	-	-	1	1	2	4
29	-	-	-	-	1	-	1
32	-	-	-	-	-	1	1
33	-	-	-	-	1	1	2
34	-	-	1	-	1	-	2
36	-	-	-	-	1	-	1
37	-	-	1	-	-	1	2
40	-	-	1	-	-	-	1
41	-	-	1	-	-	-	1
64	-	-	-	-	1	-	1
65	-	1	-	-	1	-	2
66	-	-	-	-	2	-	2
67	-	-	-	2	-	-	2
80	1	-	-	-	-	-	1
84	1	-	-	-	-	-	1
88	1	-	-	-	-	-	1
110	-	-	-	-	-	1	1
Total	3	1	4	3	9	6	26

Note: For explanation of footnote, see table 1.

Table 3 - U.S. Fishing Vessels--Documents Issued by Tonnage and Area, January 1965 1/

Gross Tonnage	New England	Middle Atlantic	Chesapeake	South Atlantic	Gulf	Pacific	Total
(Number)							
5-9	-	-	3	1	2	-	6
10-19	-	-	1	-	3	5	9
60-69	-	-	-	-	1	-	1
80-89	-	-	-	-	3	-	3
90-99	-	-	-	1	-	-	1
100-109	-	1	-	1	-	-	2
130-139	1	-	-	-	-	-	1
140-149	1	-	-	-	-	-	1
170-179	1	-	-	-	-	-	1
210-219	-	-	-	-	-	1	1
Total	3	1	4	3	9	6	26

Note: For explanation of footnote, see table 1.

Table 4 - U.S. Fishing Vessels--Documents Issued by Vessel Horsepower and Area, January 1965 1/

Horsepower	New England	Middle Atlantic	Chesapeake	South Atlantic	Gulf	Pacific	Total
(Number)							
105	-	-	-	-	1	-	1
130-139	-	-	1	-	1	2	4
165	-	-	-	-	-	1	1
200	-	-	-	-	1	-	1
218	-	-	-	-	1	-	1
220-229	-	-	1	-	2	1	4
280	-	-	-	-	-	1	1
290	-	-	1	-	-	-	1
300	-	-	-	2	1	1	4
325	-	1	-	-	-	-	1
330	-	-	-	-	1	-	1
350	-	-	-	1	-	-	1
370	-	-	1	-	-	-	1
390	-	-	-	-	1	-	1
510	1	-	-	-	-	-	1
680	1	-	-	-	-	-	1
760	1	-	-	-	-	-	1
Total	3	1	4	3	9	6	26

Note: For explanation of footnote, see table 1.

\* \* \* \* \*

# FISHERIES LOAN FUND AND OTHER FINANCIAL AID FOR VESSELS, APRIL 1-JUNE 30, 1965:

From the beginning of the program in 1956 through June 30, 1965, a total of 1,644 applications for \$42,734,194 was received by the U. S. Bureau of Commercial Fisheries, the agency administering the Federal Fisheries Loan Fund. By that date, 865 applications (\$19,206,671) had been approved, 546 (\$12,884,077) had been declined or found ineligible, 205 (\$7,859,792) had been withdrawn by the applicants before being processed, and 28 (\$758,522) were pending. Of the applications approved, 323 were approved for amounts less than applied for--the total reduction was \$2,025,132.

The following loans were approved from April 1 through June 30, 1965:

New England Area: David A. MacVane, Jr., Cliff Island, \$5,000; Colby A. Young, Corea, \$2,800; Dorothy Dodge, East Boothbay, \$1,200; Michael W. Hudlin, West Southport, \$2,500; all in Maine.

Pacific Northwest Area: Leonard Botten, Dockton, Wash., \$14,842; Richard A. Eastman, Jr., Roseburg, Oreg., \$10,000; Stanley E. Pedersen, Seattle, Wash., \$5,000; Antone F. Mariani, Tacoma, Wash., \$20,000.

Alaska: G. Gale Allen, Cordova, \$4,500; Ronald K. Sparks, Haines, \$3,000; Grant Fritz, Jr., Kasilof, \$2,400; William B. Cuthbert, Kodiak, \$104,000; Kodiak Bait Company, Kodiak, \$8,885; Oliver and Sarah A. Hofstad, Petersburg, \$15,000; Lloyd E. Pederson, Petersburg, \$10,000; Grady Lee Hamrick, Seldovia, \$15,000.

Under the Fishing Vessel Mortgage Insurance Program (also administered by the Bureau) during the second quarter of 1965, a total of 5 applications for \$227,244 was received. Since the program began (July 5, 1960), 77 applications were received for \$7,469,992. Of the total, 63 applications were approved for \$4,850,967, and 7 applications for \$1,932,342 were pending as of June 30, 1965. Since the mortgage insurance program began, applications received and approved by area are:

New England Area: Received 13 (\$1,464,500), approved 9 (\$1,034,928).

California: Received 2 (\$1,262,000), approved 2 (\$1,262,000).

South Atlantic and Gulf Area: Received 49 (\$2,806,646), approved 43 (\$1,962,969).

Pacific Northwest Area: Received 8 (\$1,861,250), approved 5 (\$526,296).

Alaska: Received 5 (\$75,596), approved 4 (\$64,774).

The first applications for a Fishing Vessel Construction Differential Subsidy under the Bureau's expanded program were received in December 1964. Through June 30, 1965, a total of 39 applications for \$8,112,500 had been received. Public hearings on 18 applications were held during that period and 4 invitations to bid on a vessel were released. The first subsidy contract and construction contract for construction of a vessel under this program were completed on June 30, 1965.



## U.S. Foreign Trade

### IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

United States imports of tuna canned in brine during January 1-May 29, 1965, amounted to 12,187,083 pounds (about 580,337 standard cases), according to preliminary data compiled by the U. S. Bureau of Customs. That was a decline of 16 percent from the 14,496,778 pounds (about 690,320 standard cases) imported during January 1-May 30, 1964.

The quantity of tuna canned in brine which can be imported into the United States during the calendar year 1965 at the 12½-percent rate of duty is limited to 66,059,400 pounds (or about 3,145,685 standard cases of 48 7-oz. cans). Any imports in excess of that quota will be dutiable at 25 percent ad valorem.



## Wholesale Prices

### EDIBLE FISH AND SHELLFISH, JUNE 1965:

Higher wholesale prices for most fresh finfish species in June 1965 than in the previous

month were more than offset by a drop in fresh and frozen shrimp prices. At 108.9 percent of the 1957-59 average, the overall index for edible fishery products (fresh, frozen, and canned) was down 0.3 percent from May to June, but was 3.1 percent higher than in June 1964.



Freezing consumer-packaged scallop meats by a New Bedford firm.

The subgroup index for drawn, dressed, or whole finfish was up 6.8 percent from May to June because of higher prices for most items: Boston prices for ex-vessel large haddock were up 19.2 percent; New York City prices for seasonal supplies of western fresh halibut were up 8.0 percent and of salmon up 5.3 percent; and Chicago prices for Lake Superior whitefish were up 6.0 percent. The exception, Great Lakes round yellow pike prices were down 15.3 percent. As compared with June 1964, the subgroup index this June was higher by 6.6 percent--prices were up from a year earlier for all items except salmon: by 17.3 percent for large haddock; by 20.9 percent for western fresh halibut; and by 44.8 percent for Lake Superior whitefish. Supplies of western fresh halibut this June were especially light, with market conditions strong.

Prices at New York City for South Atlantic fresh shrimp were sharply lower (down 16 cents a pound at wholesale) from May to June due to increased production. Although June prices were higher at Boston for fresh haddock fillets (up 7.5 percent), the subgroup index for processed fresh fish and shellfish was down 7.8 percent from the previous month due solely to the lower prices for shrimp. As compared with June 1964, the subgroup index

Wholesale Average Prices and Indexes for Edible Fish and Shellfish, June 1965 with Comparisons								
Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1957-59=100)			
			June 1965	May 1965	June 1965	May 1965	Apr. 1965	June 1964
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					108.9	109.2	108.8	105.6
Fresh & Frozen Fishery Products:					111.5	112.9	113.3	107.8
Drawn, Dressed, or Whole Finfish:					113.3	106.1	111.0	106.3
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.11	.10	88.2	74.0	69.5	75.2
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.44	.41	129.4	119.8	119.8	107.0
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.87	.83	121.4	115.3	115.3	124.7
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.62	.58	91.8	86.6	126.9	63.4
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.55	.65	90.1	106.4	163.7	69.6
Processed, Fresh (Fish & Shellfish):					109.6	118.9	114.5	114.8
Fillet, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.36	.33	86.2	80.2	85.0	77.7
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.89	1.05	104.3	123.0	117.2	117.2
Oysters, shucked, standards.	Norfolk	gal.	7.13	7.13	120.2	120.2	115.9	118.0
Processed, Frozen (Fish & Shellfish):					106.6	109.4	109.5	98.7
Fillet: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.39	98.8	98.8	93.8	92.5
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.37	.38	108.5	109.9	108.5	101.1
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.30	.30	105.2	105.2	105.2	105.2
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.89	.93	105.5	109.7	111.5	96.6
Canned Fishery Products:					104.9	103.0	101.2	102.2
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	22.00	21.00	95.9	91.5	88.3	97.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.56	11.56	102.6	102.6	101.6	102.1
Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	7.13	7.13	120.9	120.9	120.9	105.9
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	10.25	10.25	131.5	131.5	131.5	113.0

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

this June was down 4.5 percent--lower shrimp prices (down 11.0 percent) alone were again responsible for the decline.

The June 1965 subgroup index for processed frozen fish and shellfish was down 2.6 percent from the previous month. June prices were lower at Chicago for frozen shrimp (down 3.8 percent) and at Boston for frozen haddock fillets (down 1.3 percent); for other items in the subgroup there was no change. But prices this June were higher than in the same month a year earlier with the subgroup index up 8.0 percent. Frozen ocean perch fillets were at the same price level in each of the months shown.

The June 1965 index for canned fishery products rose 1.8 percent from the previous month (the same percentage increase as from April to May). The market outlook for canned pink salmon continued good in June, with prices up 4.8 percent from the previous month; but prices for other canned fishery products were unchanged. The subgroup index this June was up 2.6 percent from the same month in 1964--

prices were higher for all canned fish except salmon (down 1.1 percent).



## Youth Opportunity Campaign

### FISHING INDUSTRY CAN HELP:

This summer more than 2 million American boys and girls, 16 through 21 years of age, will enter the work force. About half of that number will be seeking permanent jobs, and a start toward useful and productive participation in the economic growth of America. The balance seek temporary jobs. For the latter there is a twofold objective--first to earn money that may spell the difference between return to school and permanent dropout; and second, this early realistic exposure to orderly work patterns may materially help in more effective orientation of their formal training upon return to the classroom.

President Johnson has asked that all segments of our economy--Federal, State, and

local agencies; private firms and other organizations--make a special effort to help in this Youth Opportunity Campaign. For example, at least 620,000 firms employ from 10 to 100 workers. If each of these employed one summer trainee per 100 workers substantial progress could be made toward meaningful work opportunities. On the Federal sector, we have been asked to apply the same ratio of one summer employee for 100 regulars.

These work opportunities should be over and above those that would normally be offered, and not in lieu of regular employment. The intent is to increase the work force, provide new employment, and expose these summer trainees to work experiences of value in selection of their future careers.

Our fishing industry has an opportunity to inject new, vigorous blood into its structure through participation in this campaign. Much of the work is seasonal in nature, lending itself to use of these summer trainees. Also, in many parts of the country, it has been difficult to interest youths in fisheries as a possible career. If we seize this chance to expose an even larger group this year, there is a mathematical probability our "catch" in this contest for the best talent will be greater. How about it? Can you help your company by participating? If so, contact your nearest State Employment office, giving details on the type and number of training opportunities available.



#### SALMON OVERCOMES OBSTACLES TO GO HOME

An amazing story about the determined spirit of a Pacific salmon has come to light in California. A salmon, named "Indomitable," has accomplished one of the most phenomenal migrations ever recorded.

Early in 1964, the salmon (then 1.5 years old) was taken from his tank in the hatchery at Orick, Calif., marked by removal of a fin, and placed in a stream some miles distant. This year, the fish made its way back to the hatchery from the Pacific through one of the most difficult obstacle courses ever constructed.

"Indomitable" swam up two creeks, through a culvert under U. S. highway 101, and into a 4-inch drain pipe with a 90-degree turn. Then the fish had to leap through a 2½-foot high pipe and over a 2-foot high wire net. At one point, the salmon had a choice of 5 pipes, 4 of which were dead-ends.

Who said there are no more big fish stories?



#### SCANDINAVIAN FISH-TAGGING METHOD BEING TRIED BY U. S. FISH HATCHERY

A method of tagging used extensively in the Scandinavian countries is being tried on trout by the Federal Fish Hatchery at Cortland, N. Y. Very small plastic discs are attached to the fish by means of stainless steel wire put through the neural spines just anterior to the dorsal fin. After attachment, the discs usually lie alongside the dorsal fin and apparently offer little restriction to movement of the fish. The flesh of the fish is very tolerant to the stainless steel wire, growing around and adhering to it very firmly. (The Progressive Fish-Culturist, July 1964.)



# FOREIGN

## International

### EUROPEAN FREE TRADE ASSOCIATION

#### MINISTERIAL MEETING IN VIENNA REVIEWS POLICY:

The Council of the European Free Trade Association (EFTA) met at the Ministerial level in Vienna on May 24, 1965. The Ministers examined the situation as it exists today in Europe, after 5 years of successful development of EFTA. They discussed the likely consequences for Europe of the deepening division resulting from the continued separate evolution of EFTA and the European Common Market (EEC). The Ministers considered that a hardening of the division could only be arrested by new initiatives. They agreed that it would be desirable to seek to arrange meetings at the Ministerial level between the two groups at the earliest opportunity which offered prospects of a fruitful result.



The Ministers reaffirmed their determination to intensify cooperation within EFTA in order to ensure the prosperity of its own members and to offer the best prospect of achieving a satisfactory basis for closer collaboration between the Association and the European Common Market. They accordingly instructed the EFTA Council at the official level to examine the further progress to be made in EFTA with that in view and to report to the Ministers in time for their next meeting, which is scheduled to be held in Copenhagen in October 1965. The Council report is to deal in the first place with the internal arrangements of EFTA, including the Economic Development Committee, with due regard to the EFTA objectives of the Association concerning agriculture and fisheries as set out in Article 2 and Articles 22 and 27 (Article 27 specifically deals with the objec-

tives for trade in fish and other marine products). Second, the report is to cover the external aspect of EFTA activities, taking into account the arrangements proposed for joint discussions with the EEC. The Council was also instructed to review the institutional arrangements of EFTA. (European Free Trade Association, Information Office, Washington, D. C. May 24, 1965.)

### FISH MEAL

#### PRODUCTION AND EXPORTS FOR SELECTED COUNTRIES, JANUARY-MARCH 1965:

Member countries of the Fish Meal Exporters' Organization (FEO) account for about 90 percent of world exports of fish meal. The FEO countries are Chile, Angola, Iceland,

Table 1 - Exports of Fish Meal by Member Countries of the FEO, Jan.-Mar. 1965

Country	March		Jan.-Mar.	
	1965	1964	1965	1964
. . . . (1,000 Metric Tons). . . .				
Chile . . . . .	15.9	17.2	31.1	42.9
Angola . . . . .	4.2	6.6	16.3	13.4
Iceland . . . . .	11.7	11.7	27.3	31.7
Norway . . . . .	16.7	13.0	42.5	53.7
Peru . . . . .	169.8	186.1	464.8	388.7
So. Africa (including S.-W. Africa) . . .	26.5	20.0	42.4	44.6
Total . . . . .	244.8	254.6	624.4	575.0

Table 2 - Production of Fish Meal by Member Countries of the FEO, Jan.-Mar. 1965

Country	March		Jan.-Mar.	
	1965	1964	1965	1964
. . . . (1,000 Metric Tons). . . .				
Chile . . . . .	10.1	4.3	33.8	47.4
Angola . . . . .	2.6	5.3	13.3	14.9
Iceland . . . . .	13.7	8.8	22.8	21.0
Norway . . . . .	31.4	28.2	56.0	43.2
Peru . . . . .	191.9	175.2	508.3	495.9
So. Africa (including S.-W. Africa) . . .	43.0	33.4	74.3	63.8
Total . . . . .	292.7	255.2	708.5	686.2



## International (Contd.):

Norway, Peru, and South Africa/South-West Africa.

Peru accounted for about 74 percent of the 624,400 metric tons of fish meal exported by FEO countries in January-March 1965.

\* \* \* \* \*

# WORLD PRODUCTION, APRIL 1965 WITH COMPARISONS:

World fish meal production in April 1965 was down about 21 percent from the previous month due mainly to a decline in Peruvian output.

World fish meal production in January-April 1965 was about the same as that in the first 4 months of 1964. Peru accounted for about 61 percent of total output in January-April 1965.

Country	April		March		Jan.-Apr.	
	1965	1964	1965	1964	1965	1964
	(Metric Tons)					
Canada .....	2,065	1,460	7,154	4,227	23,893	12,460
Denmark .....	7,473	6,591	8,434	3,810	30,723	21,608
France .....	1,100	1,100	1,100	1,100	4,400	4,400
German Fed. Rep. ....	5,726	6,736	6,123	6,388	22,027	26,271
Netherlands .....	542	500	1/	600	1,704	2,500
Spain .....	2,321	1/	1/	1/	10,038	1/
Sweden .....	782	885	1,001	527	3,440	2,897
United Kingdom .....	6,785	7,217	6,751	6,438	28,572	28,345
United States .....	9,876	6,438	2,501	2,027	16,776	11,847
Angola .....	2,314	2,753	2,654	5,296	15,571	17,633
Iceland .....	4,384	10,094	13,681	8,771	27,232	31,122
Norway .....	23,230	31,582	31,372	28,221	79,210	74,820
Peru .....	149,911	158,505	191,930	175,170	658,230	654,442
So. Afr. (including S.-W. Afr.) ...	37,635	31,543	43,091	34,188	112,182	96,980
Belgium .....	375	375	375	375	1,500	1,500
Chile .....	3,695	13,343	10,062	4,291	37,502	60,752
Morocco .....	300	350	1/	700	600	1,910
Total .....	258,514	279,472	326,229	282,129	1,073,600	1,049,487

1/ Data not available.  
Note: Japan does not report fish meal production to the International Association of Fish Meal Manufacturers at present.

World fish meal production in March 1965 was up about 51 percent from the previous month due to a sharp increase in Peruvian output and rising production in South Africa, Norway, and Iceland.

World fish meal production in January-March 1965 was up slightly from that in the first 3 months of 1964. Peru accounted for about 63 percent of total output in the first quarter of 1965. Most of the principal countries producing fish meal submit data to the International Association of Fish Meal Manufacturers monthly (see table).

## FISH OIL

### WORLD EXPORTS, 1964:

World gross exports of fish oil (including fish-liver oil) continued at a record level in 1964.

Peru, the United States, Iceland, and the Republic of South Africa are the most important world suppliers of fish oil, accounting for nearly 75 percent of the world's gross exports and about 95 percent of the world's net exports of fish oil in 1963-64. Although several European countries export sizable quantities of fish oil, the area as a whole is a net importer and takes most of the world's exports of fish oil. Much of the domestic production of fish oil in Europe is retained for domestic consumption, normally in the country of origin, or exported to other European countries as in the case of Iceland, Portugal, West Germany, and Denmark. In addition, Norway, West Germany, and the Netherlands import large quantities of fish oil for further processing and export largely to other European countries.

World Gross Exports of Fish Oil (Including Fish Liver Oils)1/								
Annual 1959-64 and 5-Year Average 1955-59								
Continent and Country	2/1964	1963	1962	1961	1960	1959	Average 1955-59	
..... (1,000 Short Tons) .....								
<b>North America:</b>								
Canada .....	15.8	6.4	3.2	4.4	15.2	14.8	8.5	
Mexico .....	0.3	0.2	0.3	0.8	3/	0.7	0.7	
United States .....	75.7	131.2	61.5	61.2	71.8	72.2	64.1	
Total No. America ..	91.8	137.8	65.0	66.4	87.0	87.7	73.3	
<b>South America:</b>								
Argentina .....	0.5	0.5	0.4	0.6	1.0	0.4	0.5	
Chile .....	15.1	12.7	12.0	5.1	6.6	0.1	4/0.1	
Peru .....	147.3	121.3	166.0	112.8	38.6	18.9	5.5	
Total So. America ..	162.9	134.5	178.4	118.5	46.2	19.4	6.0	
<b>Europe:</b>								
Denmark .....	33.5	22.9	16.8	10.5	7.4	16.1	12.5	
France .....	3.2	4.0	2.8	2.7	2.4	1.6	1.1	
West Germany .....	16.2	19.7	22.9	25.3	26.2	31.6	17.9	
Iceland .....	68.6	71.2	72.5	35.2	54.5	18.9	21.1	
Netherlands5/ & 6/ ..	2.7	2.8	2.6	5.2	7.8	16.0	10.4	
Norway6/ .....	22.3	21.2	18.6	24.0	18.4	21.8	21.3	
Portugal .....	7.5	10.5	6.7	7.4	4.9	5.7	5.1	
Sweden .....	3.0	3.4	2.0	3.4	2.5	3.0	2.5	
United Kingdom .....	2.2	2.7	2.6	3.2	3.7	3.7	3.8	
Other Countries (incl. U.S.S.R.)7/ ...	2.8	2.6	2.9	2.8	2.0	2.3	1.7	
Total Europe .....	162.0	161.0	150.4	119.7	129.8	120.7	97.4	
<b>Africa:</b>								
Angola .....	8.1	3.4	2.9	3.3	7.3	5.6	8.1	
Morocco .....	5.8	5.7	4.9	4.5	5.7	4.3	2.7	
South Africa Republic8/ .....	49.2	35.3	50.4	50.3	37.4	26.6	15.2	
Total Africa .....	63.1	44.4	58.2	58.1	50.4	36.5	26.0	
<b>Asia and Oceania:</b>								
Japan .....	2.3	2.0	3.2	2.7	3.8	3.6	5.8	
Other Countries1/ .....	0.8	0.8	0.7	0.8	1.0	1.7	1.2	
Total Asia and Oceania	3.1	2.8	3.9	3.5	4.8	5.3	7.0	
World total .....	482.9	480.5	455.9	366.2	318.2	269.6	209.7	

1/Hardened fish oils have been included wherever separately classified in export statistics.  
2/Preliminary.  
3/Under 50 tons.  
4/1959 only.  
5/May include some whale oil prior to 1960.  
6/Excludes sizable quantities of hardened fish oils exported annually which are not separately classified in trade returns.  
7/Includes estimates for minor exporting countries.  
8/Including the territory of South-West Africa.

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3/ Under 50 tons.

4/ 1959 only.

5/ May include some whale oil prior to 1960.

6/ Excludes sizable quantities of hardened fish oils exported annually which are not separately classified in trade returns.

7/ Includes estimates for minor exporting countries.

8/ Including the territory of South-West Africa.

Exports from Peru reached a record 147,300 short tons in 1964, an increase of 21 percent from 1963. The increase enabled Peru to surpass the United States and become the leading world supplier. Exports from the Republic of South Africa, Chile, Denmark, and Canada rose, while exports from the other major suppliers, the United States and Ice-

## International (Contd.):

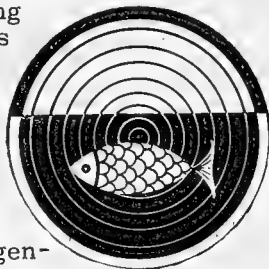
land, declined. (World Agricultural Production and Trade, U. S. Department of Agriculture, June 1965.)

Note: See Commercial Fisheries Review, Feb. 1965 p. 48, and Sept. 1964 p. 51.

## FOOD AND AGRICULTURE ORGANIZATION

**WORLD SYMPOSIUM ON WARM-WATER  
POND FISH CULTURE  
TO BE HELD IN MAY 1966:**

A World Symposium on Warm-Water Pond Fish Culture will be held in Rome, May 18-25, 1966, by the Food and Agriculture Organization (FAO) of the United Nations. The Symposium is intended to bring together fishery scientists and technicians actively concerned with some aspect of pond-fish culture.



The important contribution that fish culture can make to the improvement of human diets and general development of rural areas is being increasingly recognized all over the world. There is a need, however, to stimulate further research in fish culture and to modernize techniques.

Since the entire field of fish culture is too wide to be covered in one meeting, the Symposium at Rome will only consider selected aspects of pond culture of warm-water species (such as carp and tilapia). Cold-water species such as salmon and trout will not be considered.

The objectives of the Symposium will be to:

- (a) Evaluate warm-water pond-fish culture development in different regions of the world.
- (b) Review the present status of knowledge on: (1) the role of soil in productivity; (2) fertilization of ponds; (3) feeds and feeding; (4) control of pond weeds; (5) stock manipulation and other biological methods of increasing production; (6) breeding and selection (including induced breeding and induced sterility); (7) new systems and new fish for culture; and (8) diseases and parasites of pond fish.

(c) Delineate major problems requiring solution.

(d) Consider means of stimulating critical scientific studies on pond-fish culture and coordinating research programs.

(e) Discuss and recommend future lines of endeavour, national and international, in the study and promotion of fish culture for food.

The Symposium will be held in ten consecutive meetings. Each meeting will have a discussion leader and a rapporteur. Leading workers and specialists will be invited to contribute reviews and experience papers on the selected topics, which will be duplicated and distributed in advance of each meeting. The discussion leader of each meeting will summarize the relevant papers; the subject will then be open for discussion, and the authors of papers will have the opportunity to highlight, if required, any aspect of their contribution. If the discussion on any topic indicates the need for a closer study of any particular problem, the discussion leader will appoint an informal working group and, with the rapporteur, coordinate their work. Each rapporteur will prepare a report summarizing the discussions in his meeting, including the working group reports. Their reports will be incorporated in the Report of the Symposium after general approval by the participants.

Member Governments of FAO are being invited to nominate Symposium participants with expert knowledge in the field. Several international organizations are also being invited to send participants and observers. It is understood that participants presenting papers or contributing to discussions will do so in their individual capacity; they will not be expected to commit their governments to actions or recommendations, nor in other way formally to represent their governments or the organizations which may nominate them.

The Symposium will be conducted in English, French, and Spanish; simultaneous interpretation in those languages will be provided.

Additional information about the Symposium as well as instructions for preparing manuscripts for the meeting may be obtained from Dr. T.V.R. Pillay, Secretary, FAO World Symposium on Warm-Water Pond Fish Culture,

## International (Contd.):

Fisheries Division, FAO, Via delle Terme di Caracalla, Rome, Italy.

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GENERAL FISHERIES COUNCIL  
FOR THE MEDITERRANEAN

## ANNUAL SESSION HELD IN ROME:

Tuna Working Party Set: A working party to study the tuna and tuna-like fish of the Mediterranean was set up by the General Fisheries Council for the Mediterranean (GFCM) at its 8th Annual Session in Rome, May 10-15, 1965.



Tuna fishing off the coast of Libya. Fish are trapped in set nets.

The purpose of the GFCM working party is to determine the size, migratory habits, distribution, growth and mortality rates, spawning grounds, and sustainable annual yield of the Mediterranean's stocks of tuna and tuna-like fish. The working party also intends to organize Mediterranean-wide tuna-tagging experiments, a basic tool for studying the population dynamics of any given species of fish. Eight nations have already agreed to provide the new working party with tuna experts. They are France, Italy, Israel, Libya, Monaco, Spain, Tunisia, and Yugoslavia.

Tuna is one of the most important commercial fish species caught in the Mediterranean. All Mediterranean fishing nations catch at least some tuna. Turkey caught 19,200 metric

tons of tuna in the Mediterranean in 1963, a larger tuna catch than any of the other Mediterranean fishing nations. Italy, followed with 3,300 tons, Israel 900 tons, and Yugoslavia 300 tons. France, Morocco, and Spain have large tuna fisheries, but the bulk of their tuna catch is from the Atlantic.

Sardine-Tagging Program in Mediterranean: The first sardine-tagging program for the entire Mediterranean Sea will be initiated in 1966. The proposed program had the unanimous agreement of the 15 member nations attending the annual meeting at Rome of the General Fisheries Council for the Mediterranean. The program calls for each Mediterranean country presently fishing sardine to devote about one month to tagging some 5,000 fish each.

The sardine is of major commercial importance to the fishing nations of the Mediterranean. Tagging fish is a means for determining the growth and mortality rates, migratory routes, distribution, population dynamics, and stock sizes. The program's major aim is to revitalize the Mediterranean sardine fishing industry and to determine, through recovery of the tagged fish, how much can be caught without harming the stocks.

Other Actions: The Council also called on the Food and Agriculture Organization (FAO) for aid in drawing up a general plan for the future development of the Mediterranean's marine resources. It asked FAO to seek aid in financing such a general program through the United Nations Special Fund, the United Nations Expanded Program of Technical Assistance, and other international bodies such as the World Bank. The Council also asked FAO's help in collecting economical and statistical data on Mediterranean fisheries, and in improving Mediterranean fisheries statistical systems.

Dr. Raffaele Cusmai, Italy's Director-General of Fisheries, was elected chairman for the next GFCM biennial session, to be held in Split, Yugoslavia, in May 1967.

Member nations of the GFCM are France, Greece, Italy, Israel, Libya, Malta, Monaco, Morocco, Spain, Syria, Tunisia, Turkey, the United Kingdom, the United Arab Republic, and Yugoslavia. (Food and Agriculture Organization, Rome, May 12 and 17, 1965.)

Note: See Commercial Fisheries Review, July 1965 p. 56.

## International (Contd.):

### INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA

#### CONVENTION ENTERS INTO FORCE:

The International Convention for the Safety of Life at Sea, 1960, done at London, June 17, 1960, entered into force May 26, 1965. The new Convention (commonly called the 1960 International Rules of the Road) was formulated by the maritime nations making up the Inter-Governmental Maritime Consultative Organization. (Department of State Bulletin, April 12, 1965.)

Note: See Commercial Fisheries Review, Feb. 1965 p. 95, and Jan. 1965 p. 103.

### NORTHEAST ATLANTIC FISHERIES COMMISSION

#### THIRD MEETING HELD IN MOSCOW:

The Northeast Atlantic Fisheries Commission (NEAFC) held its third meeting in Moscow, May 11-14, 1965. Delegations were present from 13 of the 14 member countries--Belgium, Denmark, Federal Republic of Germany, France, Iceland, Ireland, Netherlands, Norway, Poland, Portugal, Spain, Sweden, Soviet Union, United Kingdom. Observers were present from the United States, International Council for the Exploration of the Sea (ICES), the International Commission for the Northwest Atlantic Fisheries (ICNAF), and from the Fisheries Division of the Food and Agriculture Organization (FAO).

At the meeting in Moscow, the Northeast Atlantic Fisheries Commission agreed on the following:

1. In the part of the Convention Area south of 48° North, from January 1, 1966, for a trial period of three years: (a) the minimum size of mesh of nets applicable should be 60 millimeters (2.35 inches); (b) minimum lengths of 24 and 21 centimeters (9.44 and 8.26 inches) should be prescribed for hake and sole, respectively; and (c) the species Discoglossa (or Dicologoglossa) cuneata should be added to the list of species which may be fished for with nets containing meshes of less than the prescribed minimum size.

2. After the Special Committee on International Control, established at the Second Meeting at the Hague in 1964, reported on the results of its deliberations, the Commission resolved that Contracting States should, within the limits of their respective jurisdictions, inspect foreign vessels to ascertain whether

they were complying with the Commission's recommendations and report the result of the inspection to the Flag State and the Commission. The Commission also agreed that the Committee should continue its work during the ensuing year with a view to studying the possibility of introducing a system of international inspection on the High Seas from January 1, 1967.

3. Until December 31, 1968, Contracting States could authorize use of top-side chafers which did not obstruct or otherwise affect the selectivity of the mesh in the cod end. The scientific evidence on which the authorization was based would be furnished to the Commission which could circulate the evidence to Contracting States.

4. (a) The minimum mesh size in the northern part of the Convention Area east of the Greenwich meridian, should be increased by 10 millimeters (0.3937 inches) from January 1, 1967; (b) from January 1, 1967, the minimum mesh size around the Faroe Islands, should be increased by 20 millimeters to 95 millimeters and 100 millimeters (0.787, 3.74, and 3.93 inches) and that a further increase of 10 millimeters should come into operation on January 1, 1970. The area in which those provisions would apply was defined as being that contained by a line drawn east from 10° west longitude along the parallel of 63° north latitude, to 4° W. longitude, then south to 60°30' north latitude, west to 5° west longitude, south to 60° north latitude, west to 15° west longitude, north to 62° north latitude, east to 10° west longitude and then north to 63° north latitude; (c) from January 1, 1969, the minimum sizes of fish prescribed for the northern part of the Convention Area should apply to the area around the Faroe Islands.

5. The present provisions on industrial landings should be extended until January 1, 1970.

6. The minimum size for dab (Limanda limanda) should be reduced from 20 centimeters to 15 centimeters but that annual reports showing the composition of "by-catches" of the dab fishery should be submitted.

7. Until December 31, 1968, vessels based on and landing their catches in ports in the area in the Irish Sea between the parallels of 54°30' and 53° north latitude and west of 5°15' west longitude could, for the purpose of catching whiting, carry and use nets of a minimum mesh size of 60 millimeters (2.36 inches).

## International (Contd.):

8. ICES should be requested to reconvene the North Western Working Group to review the state of the fish stocks in the North West Area and in the Faroes, and to provide up-to-date assessments through the Liaison Committee and to continue the activity of the North Eastern Working Group.

9. Countries fishing for cod and other species in the Arctic should provide for the Liaison Committee more data on: (a) rate of discards made by the trawlers, together with fish used for meal; (b) length measurements of landings of commercial trawlers; (c) effective selectivity of gear in use.

10. All countries should be urged to provide to the Liaison Committee regular information on the actual cod end mesh sizes in use, as measured with the standard ICES gauge, with as much information as possible to be provided by September 1, 1965.

11. The Contracting States should be requested to continue investigations designed to obtain more precise information on the selectivity of nets of different materials with regard to appropriate differentials in the prescribed minimum meshes and to submit any fresh evidence to the Liaison Committee as soon as possible.

12. The Liaison Committee should be requested to review the mixed fisheries only at intervals of three years but the Contracting States should be requested to continue to submit annual reports on the state of their mixed fisheries.

13. The Infractions Committee should be requested to consider how the intensity of inspection can best be reflected in the statistics and to report to the Commission at its next meeting.

14. The budget for the year ending June 30, 1966, should be £4.1 million pounds sterling (US\$11.5 million).

15. J.S.W. Henshaw (UK) should be appointed Secretary in place of A.K.H. Atkinson (UK), resigned.

16. The next (fourth) NEAFC meeting should be held in Edinburgh, Scotland, May 10-13, 1966. (Regional Fisheries Attache for

Europe, United States Embassy, Copenhagen, June 2, 1965.)

Note: See Commercial Fisheries Review, April 1965 p. 43; and August 1964 p. 52.

## TRADE PROTOCOL

## SOVIET-NORWEGIAN PACT PROVIDES FOR EXCHANGE OF FISHERY PRODUCTS:

The Soviet Union and Norway signed a 3-year Trade Protocol in Oslo on January 29, 1965. The Protocol provides for an annual export to the Soviet Union of 5,000 metric tons of frozen herring and herring fillets, 10,000 tons of frozen fish and fish fillets, and 5,000 tons of salted herring in 1965, 1966, and 1967. In addition, the Soviets will import unspecified amounts of Norwegian canned fishery products and fishing equipment.

Soviet fishery exports to Norway will consist entirely of canned king crab in the amount of 3,400 cases for each of those three years.

The Soviets agreed to accept the delivery of 5,000 tons of salted winter herring only after prolonged negotiations. The 1964 Norwegian-Soviet trade agreement provided for the delivery of 15,000 tons of salted herring to the U.S.S.R. but, because of the poor quality of 1964 Norwegian herring catches, only about 5,000 tons were actually sold. The Soviets cited the Norwegian failure to fulfill the 1964 delivery as the reason for reducing the 1965 quota.



## Australia

## TUNA CATCH DOWN IN 1965:

The total Australian tuna catch for 1965 was 7,525 tons, compared with the 1964 record of 8,978 tons.

Two vessels, the Ekalta and the Caroline Star, surveyed new fishing areas to the south-east of Port Lincoln as far as Portland. Their survey was made after spiny lobster fishing vessels reported tuna in the area.

In the coming 1966 season, the largest wooden fishing vessel to be built in Australia is expected to enter the tuna fishery. Under construction at a Birkenhead shipyard, the 87-foot tuna vessel is expected to cost A£85,000 (US\$190,400).

### Australia (Contd.):

The 1965 South Australian tuna fishing season ended in May with a total catch of 5,215 short tons, 848 tons less than in the 1964 season. The catch for April was 1,413 tons, but tapered off in the first two weeks in May when only 50 tons were landed.

As of April 15, the total tuna catch off South Australia during the 1965 season amounted to 4,706 short tons, an increase of 333 tons over the catch during the same period of the 1964 season.

In the last 2 weeks in March 1965, the South Australian tuna fleet of 22 vessels caught 1,226 tons of bluefin tuna--a record for any 2-week period since the fishery began in 1952. In February-March 1965, one of the top vessels caught 350 tons of tuna.

Operations this year have been concentrated on areas off Neptune and Rocky Islands, Coffin Bay, and Pearson Island. The Tacoma in March explored grounds farther to the west and returned after 7 days with 44 tons of tuna aboard. The Degei worked south off the Continental Shelf and caught 53 tons.

Rough weather in March and early April restricted operations by the three vessels engaged in the search for tuna on the eastern and southern coasts of Tasmania.

While searching for tuna off Tasmania, the Australian research vessel Marelda tagged 80 bluefin in a 2-week period. (Australian Fisheries Newsletter, June 1965; May 1965.)

Note: See Commercial Fisheries Review, June 1965 p. 36, and April 1965 p. 60.

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### RESULTS OF TASMANIAN TUNA SURVEY NOT UP TO EXPECTATIONS:

A progress report on operations during the first 3 months of the Tasmanian tuna survey, issued after a meeting in Hobart of the joint committee organizing the survey, said that results so far had not been particularly encouraging.

The survey in eastern Tasmanian waters, financed jointly by the Commonwealth Government from the Fisheries Development Trust Fund and the Tasmanian State Government, began on February 1, 1965. Two chartered tuna vessels and an airplane were used in an

attempt to assess the prospects of developing a commercial tuna fishery in Tasmanian waters by the pole-and-live-bait method of fishing.

The weather was not particularly favorable for most of the period and the hours steamed by the vessels was slightly below expectation. Aerial spotting was conducted as planned and the research vessel Marelda of the Commonwealth Scientific and Industrial Research Organization (CSIRO) also operated as planned, collecting hydrographic information.

Sightings of bluefin tuna in the first 3 months were not extensive enough to justify commercial operations. But quantities of striped tuna, sufficiently large to encourage gill-net fishing were sighted.

Officers of the Division of Fisheries and Oceanography of CSIRO, who are responsible for the technical direction of the survey, advised that the results of the survey must be examined in conjunction with environmental conditions found.

The 65° F. isotherm did not advance further south than Cape Barron and it was only in that region that bluefin tuna were poled. All bluefin tuna taken further south were caught on trolling lines. This pattern of behavior is consistent with bluefin behavior in other areas, and indicates that a bluefin tuna fishery in eastern Tasmanian waters would be regulated by the annual intrusion of warmer water from the north in summer. The depth of this intrusion varies from year to year.

Since the report was issued, a Victorian shark fisherman reported passing through shoals of tuna off Sandy Cape, on the West Coast of Tasmania. An aerial search under good conditions found only a dozen bluefin tuna in the area. Acres of striped tuna were seen in Bass Strait, off Flinders Island.

A spotting airplane in mid-May spotted a number of schools of bluefin and striped tuna off the southern coast of the island, and some were estimated to contain 5 tons of fish. However, the tuna were feeding, and appeared only briefly on the surface and could not be poled. (Australian Fisheries Newsletter, June 1965.)

Note: See Commercial Fisheries Review, April 1965 p. 51.

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## Australia (Contd.):

**NEW SMOKED TUNA  
PRODUCT INTRODUCED:**

A new fishery product--smoked pressed tuna--is being marketed in Australia by the South Australian Fishermen's Cooperative.

The cooked smoked tuna will be available as a 5-pound loaf, or in slices, and is expected to sell at retail for about 8½ Australian shillings (about 95 U. S. cents) a pound. Fresh and chilled it can be used for sandwiches, with salads, and with smorgasbords. (Australian Fisheries Newsletter, June 1965.)

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**SCALLOP AND SHRIMP  
FISHERY TRENDS, EARLY 1965:**

**Scallops:** During the 9-months period ending March 31, 1965, scallop landings in the State of Victoria amounted to 149,000 bags with a total ex-vessel value of A£245,699 (US\$546,680). In March 1965, there were 51 vessels fishing for scallops off Victoria. In April 1965, prices for scallop meats reached 2s. 6d. (27.5 U. S. cents a pound), the highest level of the 1964/65 season which began July 1, 1964.

In mid-May 1965 in the State of Tasmania, 10 vessels were fishing on the east coast, and catches of up to 60 bags of scallops a day were reported from the Bicheno area.

**Shrimp:** In Western Australia, it has been reported that the number of vessels to be licensed to fish for shrimp in Exmouth Gulf will be limited to 15 during 1965 and 1966. (Australian Fisheries Newsletter, June 1965.)

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**FISHERY PRODUCTS EXPORTS  
UP IN FISCAL YEAR 1964/65:**

If trends for the first 9 months of fiscal year 1964/65 (July 1964 to June 1965) were to continue, Australian marine exports for that year could total A£10 million (US\$22.4 million) for the first time.

**Trends in Australian Marine Export Markets** published by the Fisheries Branch of the Australian Department of Primary Industry showed that for the 9 months ended March 31, 1965, exports were valued at \$15.2 million, an increase of 23.1 percent as compared with the same period in 1963/64.

Frozen spiny lobster tails remain the most valuable item; exports for the 9 months being valued at \$9.3 million compared with \$8.4 million in the corresponding period in 1963/64. The March 1965 exports valued at \$1.9 million were nearly double those for March 1964.

The total quantity of spiny lobster tails exported for the 9 months ended March 31, 1965, were 4.8 million pounds as compared with 6.4 million pounds in the same period in 1963/64, but the drop in quantity was more than compensated for by record prices prevailing in the United States market. Prices paid in New York City in March 1965 for 10-12 oz. Australian spiny lobster tails ranged from \$2.40 to \$2.42 a pound, compared with \$1.70 to \$1.75 in the same month of 1964.

Australia's shrimp exports for March 1965 were at their highest level since September 1964. Most of the shrimp exports during the month went to South Africa and Japan. A total of 1.8 million pounds valued at \$1.6 million was exported in the 9 months ended March 31, 1965, compared with 771,000 pounds valued at \$759,000 for the same period in 1963/64.

About 39,000 pounds of tuna valued at \$4,500 was exported to Japan and Italy during March 1965, bringing the total tuna exports for the 9 months ended March 31, 1965, to 776,000 pounds valued at \$105,000.

Australia's exports of scallops in the first 9 months of fiscal year 1964/65 totaled 1.4 million pounds valued at about \$800,000. Of that total, about 1 million pounds valued at close to \$600,000 went to France, with shipments also to the United States market. (Australian Fisheries Newsletter, June 1965.)

Notes: (1) Values converted at rate of A£1 equals US\$2.24.  
(2) See Commercial Fisheries Review, March 1965 p. 67, and January 1965 p. 63.

**Bulgaria****ATLANTIC FISHERIES  
EXPANSION PLANNED:**

The Bulgarian Government has authorized the construction of a new fishing port and fish-processing plant at Burgas, on the Black Sea. The port will be the first to service the Bulgarian high-seas fishing fleet which is be-

## Bulgaria (Contd.):

ing organized through domestic construction and purchases in the U.S.S.R. The construction of a 310-meter (1,017-foot) wharf was begun in January 1965 after East German naval specialists dredged the adjacent Bay of Burgas to accommodate vessels having a draft of up to 9 meters (29.5 feet).

Adjoining the new fishing port will be a fish-processing plant capable of producing 13,000 metric tons of fishery products annually (10,000 tons of canned, 1,000 tons of smoked, 1,000 tons of salted, and 1,000 tons of semi-finished fishery products). The new processing plant will be the only one of its kind in Bulgaria; its output will be marketed domestically.

A cold-storage warehouse with a capacity of 4,000 tons of fish will also be located near the Burgas fishing port, which is scheduled to become fully operational at the end of 1966.

Most of the machinery and equipment for both the fishing port and the fish-processing plant will be supplied by the Soviet Union under the U.S.S.R.-Bulgarian aid agreement of January 24, 1964. The agreement also provides for the delivery to Bulgaria of 20 large stern factory trawlers and 4 refrigerated fish transport vessels by 1970. The Soviet Union has already delivered to Bulgaria the Tropik-class trawlers Feniks and Albatross under long-term credits provided by the aid agreement. In return for Soviet aid, the Bulgarians will begin constructing 300-gross-ton fishing trawlers for the U.S.S.R. (120 such vessels are to be delivered by 1970).

Plans call for the proposed Bulgarian fishing fleet of 20 factory stern trawlers to remain on the fishing grounds for 3 to 6 months, catching and processing 25 to 30 tons of fish daily. They will be serviced about every 2 weeks by a refrigerated carrier which will transport the finished and semifinished fishery products to Burgas. This is essentially the system of operations employed by the U.S.S.R. in her distant fisheries. The Bulgarians will first try to develop West African operations, but as more vessels are obtained, trips to Icelandic and Northwest Atlantic grounds are planned. Later, fishing may be expanded into the Indian Ocean, but this will depend to a great extent on the success the

Soviet fishermen have there. By 1980, about 1,600 Bulgarians may be employed in high-seas fisheries.

In the past, Bulgaria has limited its fisheries mostly to fresh waters (the Danube River, lakes and ponds) and to the Black Sea where her fisheries are regulated by the Joint Black Sea Fisheries Commission composed of the U.S.S.R., Rumania, and Bulgaria. Less favorably situated for Black Sea fishing than the Soviet Union or Turkey, Bulgaria began planning in 1962 for a high-seas fishery with Soviet assistance. The plans were spelled out at the Eighth Congress of the Bulgarian Communist Party in 1962 and approved by the Second Session of the Fourth National Assembly. The Bulgarian goal for the fishery catch of 1980 was set at 100,000 tons, or 9 times the 1962 fishery catch of 10,000 tons.

Note: See Commercial Fisheries Review, April 1964 p. 51.



## Republic of Cameroon

### FISHERY TRENDS, 1964:

Fishery landings in Cameroon (West Africa) in 1964 by her fleet of 14 trawlers amounted to 8,000 metric tons. About 1,700 persons were engaged in that country's fishing industry, with wages paid for the year totaling some 170 million CFA francs (US\$700,000).



The Cameroon fishing industry was estimated to have spent \$1 million in 1964 for ice, boxes, fuel, and other provisions in connection with its fisheries. A small modern new fishing port was scheduled to be ready at Douala by early summer 1965.



## Chile

### FISH MEAL INDUSTRY CONTINUES TO SUFFER FROM ANCHOVETA SHORTAGE IN APRIL 1965:

Poor fishing in April 1965 added yet another month to the prolonged anchoveta shortage which has left the \$75 million Chilean fish meal industry in a serious financial crisis. Six plants are reported closed and others are closing (some continue to fish, but pool the catch for processing in one plant to reduce unit costs). The Chilean Fisheries Development Institute reports that fish meal production has dropped to about 10 percent of installed capacity. The number of fish meal industry workers thrown out of work in Tarapaca Province is estimated at 3,000.

On May 11, 1965, the Production Development Corporation of Chile (CORFO) granted its Executive Vice President broad authority to take a variety of measures to: (1) alleviate the current financial burdens on the fish meal companies; (2) promote a more efficient industry; and (3) foster other development projects which would offset growing unemployment in fisheries. Details concerning the program are expected to be announced soon.

Unfortunately relief measures can't supply the missing anchoveta. (United States Embassy, Santiago, May 15, 1965.)

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### SHELLFISH INDUSTRY SHOWS PROMISE:

With an anchoveta shortage plaguing the fish reduction industry in northern Chile, interest is beginning to turn to the less developed fisheries off the central and southern coasts of the country. The shellfish industry, in particular, is attracting attention.

A rise in exports is expected because of expanded output of frozen shrimp (a deep-water species) and langostino (a salt-water crayfish classified in some foreign markets as "baby rock lobster-type meat"). Annual export earnings from that trade might reach \$5 million within 3 years. In addition, the domestic market for fresh and frozen shrimp and langostino is largely untapped. Another possibility for the Chilean shellfish industry is the development of an export market for spiny lobsters.

Shrimp and Langostino: Official Chilean data show a 1963 catch of 3,634 metric tons

of shrimp and 9,248 tons of langostino, as compared with 4,346 tons of shrimp and 7,986 tons of langostino in 1962. Preliminary data show some increase in 1964 landings.

Ex-vessel prices of shrimp with heads on were up sharply in 1964, ranging from escudo 3.0 to 3.6 for a box of 16 kilos (about 2.5 to 3.0 U. S. cents a pound). That was an increase of about 60 percent over the 1963 prices. In 1964, langostino (with heads on) ex-vessel prices were escudo 2.0 to 2.2 for a box of 14 kilos (1.9 to 2.1 U. S. cents a pound), as compared with 1963 prices ranging from escudo 1.2 to 1.5 (1.1 to 1.4 U. S. cents a pound).

The recovery rate of shrimp meat is about 16 percent of landings, while langostino yields 8 to 10 percent.

Chile produced 925 tons of frozen shrimp and 776 tons of frozen langostino in 1964, as compared with 553 tons and 674 tons, respectively, in 1963. Canned output of shrimp and langostino combined totaled 88 tons in 1964 and 83 tons in 1963.

About 85 percent of Chile's frozen shrimp and langostino output is exported. Frozen shrimp exports in 1964 totaled 774 tons with a value of US\$1.1 million. The United Kingdom was the leading buyer, followed by the United States and Germany. Shipments to the European market where higher prices prevail have been encouraged by the Chilean Government through its export licensing system.

Although exact data on frozen langostino exports are not available, it is known that about 85 percent of all shipments go to the United States.

Sales of canned shrimp and langostino depend mainly on the domestic market in Chile.

Shrimp and langostino are fished commercially off Chile from Coquimbo to Talcahuano by trawlers at depths up to 500 fathoms. Shrimp are captured the year round; langostino from March until mid-December. A larger shrimp is being captured off Constitucion than that taken to the north of San Antonio. Experimental fishing indicates that shrimp can be fished along the coast to the Straits of Magellan, but further study is necessary to determine the feasibility of commercial exploitation in the southern waters.

## Chile (Contd.):

At the close of 1964 there were at least 6 plants freezing shrimp and langostino in Chile, and 2 other freezing plants were under construction. Other fishing companies were thinking of entering the field.

Chilean shrimp are not generally sorted by size. All shrimp and langostino are cooked and peeled before freezing, but only the langostino are deveined. The pack consists of individually frozen tails as well as the block-frozen product. Processing of individually frozen tails will increase with the completion of several blast-freezing tunnels now under construction. Most firms now use plate freezers.

**Spiny Lobster:** One of the new shrimp-freezing plants being built in San Antonio, Chile, is also interested in the potential of Chile's spiny lobster resources--now exploited only on a limited scale and almost entirely for the domestic market. If exploratory fishing justifies an investment, the company (which is predominately foreign owned) could place a well-equipped fleet in spiny lobster fishing. Its catch would most likely be processed for the export market. (United States Embassy, Santiago, May 25, 1965.)



## Denmark

EXPORTS OF FISHERY PRODUCTS  
AND BYPRODUCTS,  
JANUARY-MARCH 1965:

**Exports to All Countries:** Denmark's total exports of fishery products and byproducts in January-March 1965 were up 7 percent in quantity and 19 percent in value as compared with the same period in 1964. Exports were up for all major items in quantity and value except frozen fishery products. Despite the lower exports of frozen fishery products in the first quarter of 1965, the value rose 14 percent from the same quarter in 1964 due to increased exports of cod as against a drop in herring exports. With higher world prices for fish meal, exports of that product were up 41 percent in quantity and 64 percent in value.

**Exports to United States:** The value of Danish fishery products exports to the United States in the first quarter of 1965 was higher than

in the same period of 1964. After a sharp drop from 1963 to 1964, Danish shipments of frozen cod blocks to the United States market made a comeback. Exports of canned herring and sprat also were higher probably because of the smaller pack of canned Maine sardines.

Danish Exports of Fishery Products, January-March 1964 and 1965				
Products	January-March			
	1/1965		1964	
	Qty.	Value	Qty.	Value
	Metric Tons	US\$ 1,000	Metric Tons	US\$ 1,000
<b>To all countries:</b>				
Fresh products.....	55,127	13,823	53,829	12,323
Frozen products.....	11,422	6,722	12,435	5,864
Processed fishery products	1,998	1,499	3,998	2,713
Fish meal & solubles, etc. 2/	18,032	2,753	12,762	1,673
<b>Canned products:</b>				
Fish.....	1,711	959	3/	3/
Shellfish.....	410	488	-	-
Semipreserved products ..	733	716	3/	3/
<b>Total .....</b>	<b>89,433</b>	<b>26,960</b>	<b>83,024</b>	<b>22,573</b>
<b>Fish oil .....</b>	<b>12,405</b>	<b>2,405</b>	<b>3/</b>	<b>3/</b>
<b>To United States:</b>				
<b>Fresh &amp; frozen products:</b>				
<b>Fillets:</b>				
Cod .....	1,508	873	1,016	458
Other fillets .....	4	4	36	23
Pond trout .....	84	86	104	117
Norway lobster .....	27	85	65	177
Other .....	15	16	29	23
Cured products (smkd. & sltd.)	6	5	9	6
<b>Canned products:</b>				
Herring & sprat .....	242	150	161	106
Shrimp .....	19	27	41	57
Other .....	34	20	19	15
Semipreserved products...	9	13	4	7
Fish solubles .....	150	22	-	-
<b>Total .....</b>	<b>2,098</b>	<b>1,301</b>	<b>1,484</b>	<b>989</b>

1/Preliminary.

2/Includes ensilage and trout food.

3/Not shown.

Notes: (1) Values reported in Danish kroner and converted to U. S. dollars; 1 kroner equals \$0.145.

(2) Fish oil data not shown because they are collected by another Ministry.

Source: Danish Ministry of Fisheries.

**Exports to Other Markets:** In January-March 1965, exports to European Common Market countries were valued at US\$11.5 million, an 11-percent increase from the same period in 1964. Shipments to European Free Trade Association (EFTA) countries in the first quarter of 1965 were also valued at \$11.5 million, having increased 31 percent from 1964. West Germany was the leading buyer of Danish fishery products in the first quarter of 1965 with receipts valued at \$7.8 million, followed by the United Kingdom with a value of \$4.6 million. Shipments to Sweden during the period were valued at \$4.1 million. Those countries ranked in the same order as in the previous year as buyers of Danish fishery products and byproducts. (Regional Fish-

## Denmark (Contd.):

eries Attache for Europe, United States Embassy, Copenhagen, May 26, 1965.)

**Ecuador**TUNA LANDINGS AND EXPORTS, 1964:

Ecuadoran landings of tuna and bonito dropped from a total of 13,100 metric tons in 1963 to 9,800 tons in 1964, according to preliminary data from the Ecuadoran National Fisheries Institute. Bad weather was said to be one of the causes of the decline.

In spite of the drop in landings, Ecuadoran exports of canned tuna increased. A total of 1,877 tons of canned tuna valued at US\$1.19 million was shipped in 1964, compared with 1,586 tons valued at \$976,000 in 1963. All but about 6 percent of the canned tuna exports were for the United States market. Local consumption of canned tuna in Ecuador in 1964 reached 212,000 cases (24 pounds each), only slightly less than the amount exported. Local consumption in 1965 is forecast at about the same level.

In 1964, exports of whole frozen tuna totaled 3,103 tons valued at about \$494,000 as compared with 2,046 tons worth \$320,000 in 1963. The 1963 exports also included 1,325 tons of headed and gutted frozen tuna valued at \$220,000. Comparable data on 1964 exports of headed and gutted tuna were not available. As in the case of canned tuna, the United States is the leading market for Ecuadoran exports of frozen tuna.

The Ecuadoran tuna fleet increased by 7 units in 1964 to a total of 51 vessels. Most of those have a limited range and concentrate their activity around the port of Manta and the Santa Elena peninsula when the tuna are running. As of summer 1965, 4 purse-seine tuna vessels were operating, of which 3 (with capacities of 50 to 80 tons each) belonged to a large cannery (operated by U. S. interests) at Manta. (United States Consul, Guayaquil, June 18, 1965.)

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SHRIMP LANDINGS AND EXPORTS, 1964:

Ecuador's annual shrimp landings have leveled off at about 5,000 metric tons (live-

weight basis) in recent years. Most of those landings are frozen for export, mainly to the United States.

Ecuador's exports of frozen shrimp tails in 1964 amounted to 2,441 tons valued at US\$1.7 million, compared with 2,453 tons valued at \$1.6 million in 1963. Domestic annual consumption is estimated at about 350 tons (live-weight basis).

There were no large investments in Ecuador's shrimp industry in 1964. The shrimp fleet currently comprises 160 vessels, 24 of which were built in 1963, the most active construction year since 1958 when 31 vessels were launched. Improved refrigeration and net handling equipment are being installed on some of the vessels, but a large part of the shrimp fleet still lacks the gear and refrigeration equipment which would permit fishing off the coast in waters of 30 fathoms or more. (United States Consul, Guayaquil, June 18, 1965.)

\*\*\*\*\*

SPINY LOBSTER LANDINGS AND EXPORTS, 1964:

Ecuador's exports of frozen lobster tails have risen consistently in recent years, but declined somewhat in 1964 to 80 metric tons valued at US\$130,000, compared to 92 tons worth \$152,000 in 1963. The catch (live-weight basis) fell off from 400 tons in 1963 to 300 tons in 1964, due in part to the lack of organization in the industry. Although one firm has been experimenting with traps, which have the disadvantage of being easily stolen, lobsters are mostly caught by net and hand. Preliminary statistics show that live lobster exports climbed to 15 tons in 1964 valued at \$7,500, compared to only 4 tons in 1963 worth \$1,900. Almost all lobster exports go to the United States. (United States Consul, Guayaquil, June 18, 1965.)

**El Salvador**EXPORT TAX ON SHRIMP BEING STUDIED:

Possible modifications to the export tax levied on shrimp by El Salvador are being studied by a committee made up of officials of the Salvadoran Ministries of Economy and Finance. The shrimp export tax is now 6 U.S.

## El Salvador (Contd.):

cents a pound regardless of the value of the shrimp. Such a tax tends to limit shrimp exports to the United States to the larger sizes. Salvadoran exporters find it unprofitable to ship smaller and less costly shrimp because of the high proportion of the sales price absorbed by the export tax. (United States Embassy, San Salvador, May 21, 1965.)



## Guatemala

## FROZEN SHRIMP EXPORTS, 1964:

Guatemala's exports of frozen shrimp in 1964 amounted to 2.9 million pounds valued at slightly more than US\$1 million. The greater part went to the United States which received 2.2 million pounds.

In January-March 1965, United States imports of frozen shrimp from that country totaled 498,000 pounds as against 631,000 pounds in the same period a year earlier. (United States Embassy, Guatemala, May 20, 1965.)



## Iceland

## EXPORT STOCKS OF PRINCIPAL FISHERY PRODUCTS, APRIL 30, 1965:

Iceland's stocks of frozen groundfish (fillets) for export to the United States totaled 7,100 metric tons as of April 30, 1965.

United States imports of frozen groundfish fillets from Iceland in the year 1964 totaled

Icelandic Export Stocks <sup>1/</sup> of Principal Fishery Products, April 30, 1965			
Item	Quantity	Value	
		Metric Tons	US\$ 1,000
<b>Groundfish, frozen:</b>			
For export to:			
U. S. . . . .	7,100	156.2	3,627.5
Other countries . . .	4,552	78.7	1,827.7
<b>Stockfish . . . . .</b>	<b>4,500</b>	<b>126.0</b>	<b>2,926.1</b>
<b>Herring:</b>			
Salted . . . . .	2/	2.1	48.8
Frozen . . . . .	1,174	6.7	155.6
<b>Industrial products:</b>			
Fish meal:			
Herring . . . . .	1,147	8.3	192.7
Other fish . . . . .	9,519	48.4	1,124.0
Herring oil . . . . .	14,783	122.7	2,849.5

<sup>1/</sup>Includes only stocks intended for export.

<sup>2/</sup>Not available.

Note: Icelandic kronur 43.06 equal US\$1.00.

17,812 metric tons of groundfish blocks and slabs, 4,669 tons of cod fillets, 2,791 tons of haddock fillets, and 548 tons of ocean perch fillets. (United States Embassy, Reykjavik, June 2, 1965.)

\* \* \* \* \*

## FISHERY LANDINGS BY PRINCIPAL SPECIES, 1963-64:

Species	Jan.-Nov.		Year Totals	
	1964	1963	1964	1/1963
(Metric Tons)				
Cod . . . . .	275,189	226,508	280,703	240,068
Haddock . . . . .	53,134	46,850	56,689	51,606
Saithe . . . . .	21,223	13,722	21,793	14,712
Ling . . . . .	4,699	5,318	4,990	5,601
Wolfish (catfish) . . . . .	8,218	17,077	8,289	17,463
Cusk . . . . .	3,225	5,473	3,542	5,849
Ocean perch . . . . .	26,757	31,718	27,707	35,373
Halibut . . . . .	1,151	1,112	1,205	1,232
Herring . . . . .	516,733	383,801	544,396	395,166
Shrimp . . . . .	497	603	542	649
Capelin . . . . .	8,640	1,077	8,640	1,077
Lobster . . . . .	2,628	5,177	2,631	5,179
Other . . . . .	10,097	7,375	10,387	7,994
<b>Total . . . . .</b>	<b>932,191</b>	<b>745,811</b>	<b>971,514</b>	<b>781,969</b>

<sup>1/</sup>Revised.

Note: Except for herring which are landed round, all fish are drawn weight.

\* \* \* \* \*

## UTILIZATION OF FISHERY LANDINGS, 1963-64:

How Utilized	Jan.-Nov.		Year Totals	
	1964	1963	1964	1/1963
(Metric Tons)				
<b>Herring<sup>2/</sup>:</b>				
Canning . . . . .	218	296	270	296
Oil and meal . . . . .	436,057	271,489	460,409	274,704
Freezing . . . . .	24,703	32,260	26,420	37,723
Salting . . . . .	55,755	73,955	57,298	76,642
Fresh on ice . . . . .	-	5,802	-	5,802
<b>Groundfish<sup>2/</sup> for:</b>				
Fresh on ice . . . . .	35,945	34,375	39,892	40,171
Freezing and filleting . . . . .	178,659	162,496	183,849	174,485
Salting . . . . .	88,907	70,527	89,685	72,459
Stockfish (dried unsalted) . . . . .	83,346	70,983	84,119	74,256
Canning . . . . .	27	47	27	47
Oil and meal . . . . .	3,548	3,321	3,687	3,573
<b>Capelin for:</b>				
Freezing . . . . .	133	188	133	188
Oil and meal . . . . .	8,507	889	8,507	889
<b>Shrimp for:</b>				
Freezing . . . . .	299	475	344	507
Canning . . . . .	198	128	198	141
<b>Lobster for:</b>				
Fresh on ice . . . . .	-	2	-	2
Freezing . . . . .	2,628	5,175	2,630	5,177
Home consumption . . . . .	13,261	13,403	14,046	14,907
<b>Total production . . . . .</b>	<b>932,191</b>	<b>745,811</b>	<b>971,514</b>	<b>781,969</b>

<sup>1/</sup>Revised.

<sup>2/</sup>Whole fish.

<sup>3/</sup>Drawn fish.

Source: Aegir, March 1 and 15, 1965.





## India

### JAPANESE FISHING FIRM PLANS JOINT SHRIMP COMPANY IN INDIA:

A Japanese fishing company, after surveying shrimp fishing prospects in India, is reported to have started negotiations to establish a joint shrimp fishing and processing enterprise in that country. At present, one Japanese company is engaged in shrimp fishing in India (at Cochin) and is said to be doing well. (Suisancho Nippo, June 24, 1965.)



## Japan

### FROZEN TUNA EXPORTS TO U. S. AND PUERTO RICO, JANUARY-MARCH 1965 AND YEAR 1964:

Japan's exports of frozen tuna to the United States and Puerto Rico in March 1965 were

down 46.1 percent in quantity and 45.1 percent in value from the previous month when they totaled 10,050 short tons. As compared with January 1965, the March exports were lower by 24.5 percent and 30.0 percent, respectively.

The March exports were about equally divided in quantity between the United States and Puerto Rico, with albacore tuna accounting for 67 percent and yellowfin 32 percent. The remainder was mostly big-eyed tuna.

Albacore tuna accounted for 59.7 percent of Japan's total frozen tuna exports to the United States and Puerto Rico in 1964, and yellowfin 39.6 percent. The remainder was mostly big-eyed tuna. Of the total exports to the United States, albacore accounted for 57.3 percent and yellowfin 41.8 percent. Exports to Puerto Rico were made up of 63.0 percent albacore, with the remainder mostly yellowfin and some big-eyed tuna. (Fisheries At-

Table 1 - Japan's Exports of Frozen Tuna by Species to United States and Puerto Rico, January-March 1965

Species	1965						Total	
	March		February		January		Jan.-March 1965	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	Short Tons	US\$1,000	Short Tons	US\$1,000	Short Tons	US\$1,000	Short Tons	US\$1,000
<b>Skipjack:</b>								
United States . . . . .	2	1	3	4	3	4	8	10
Puerto Rico . . . . .	-	-	-	-	-	-	-	-
Total . . . . .	2	1	3	4	3	4	8	10
<b>Albacore:</b>								
United States . . . . .	1,270	383	4,170	1,183	3,454	1,173	8,894	2,739
Puerto Rico . . . . .	2,335	634	4,069	1,113	2,395	659	8,799	2,406
Total . . . . .	3,605	1,017	8,239	2,296	5,849	1,832	17,693	5,145
<b>Yellowfin:</b>								
United States . . . . .	1,303	406	1,267	388	544	165	3,114	959
Puerto Rico . . . . .	405	97	455	114	782	207	1,642	418
Total . . . . .	1,708	503	1,722	502	1,326	372	4,756	1,377
<b>Big-eyed:</b>								
United States . . . . .	98	24	30	4	-	-	128	28
Puerto Rico . . . . .	5	1	56	11	-	-	61	12
Total . . . . .	103	25	86	15	-	-	189	40
Total United States . .	2,673	814	5,470	1,579	4,001	1,342	12,144	3,736
Total Puerto Rico . . .	2,745	732	4,580	1,238	3,177	866	10,502	2,836
Grand total . . . . .	5,418	1,546	10,050	2,817	7,178	2,208	22,646	6,572

Source: Japan's Bureau of Customs.

Table 2 - Japan's Exports of Frozen Tuna by Species to United States and Puerto Rico, 1964

Species	United States		Puerto Rico		Total	
	Quantity	Value	Quantity	Value	Quantity	Value
	Short Tons	US\$1,000	Short Tons	US\$1,000	Short Tons	US\$1,000
Albacore . . . . .	35,987	11,413	29,138	9,261	65,125	20,674
Yellowfin . . . . .	26,286	8,755	16,926	4,406	43,212	13,161
Big-eyed . . . . .	539	115	199	42	738	157
Skipjack . . . . .	3	2	-	-	3	2
Bluefin . . . . .	3	1	-	-	3	1
Total . . . . .	62,818	20,286	46,263	13,709	109,081	33,995

Source: Japan's Bureau of Customs.

## Japan (Contd.):

tache, United States Embassy, Tokyo, April 16 and May 28, 1965.)

\* \* \* \* \*

#### FOURTH CANNED TUNA IN BRINE SALE TO UNITED STATES:

The Japan Tuna Packers Association announced June 15, 1965, that it planned to offer for the fourth sale (June-July) 250,000 cases (performance quota 175,000 cases and adjustment quota 75,000 cases) of canned tuna in brine for export to the United States. The sale was to consist of 220,000 cases of white meat tuna (20 percent of which must be chunk style) and 30,000 cases of the light meat 4-lb. pack, including a small quantity of the 7-oz. and 3 $\frac{1}{4}$ -oz. pack. The Association set the shipping period deadline as July 15 and revealed that it was providing US\$110,000 for the summer promotion of the 220,000 cases of white meat tuna.

Subsequent buy tenders submitted by trading firms amounted to only 44,163 cases of the available adjustment quota. (Note: Firms which use their performance quota and wish to export additional quantities can dip into the adjustment quota.) The lack of buying interest shown by trading firms was said to reflect poor market conditions in the United States for Japanese tuna. (Suisancho Nippo, June 17, 1965; Kanzume Nippo, June 22, 1965.)

\* \* \* \* \*

#### CANNED TUNA MARKET TRENDS:

A recent Japanese survey of U. S. canned tuna market conditions revealed that prices of U. S.-advertised brands advanced, while prices of Japanese name brands held firm. Despite this trend, most of the 18 designated Japanese firms exporting canned tuna in brine to the United States were asking the Japan Canned Tuna Sales Company to reduce prices. The survey also revealed that on the third sale (offering of 350,000 cases) conducted by the Sales Company, the trading firms failed to completely use the full quantity of 105,000 cases offered under the 30-percent adjustment quota; whereas at the second sale (120,000 cases represented the adjustment quota) conducted in early May, the exporting firms submitted offers greatly exceeding (by nearly 90,000 cases) the quantity put up for sale by the Sales Company.

Observers in Japan viewed these developments as follows:

1. The price decline in the frozen albacore market since early this year has enabled U. S. packers in Puerto Rico to pack tuna at substantially lower costs, and they are using gains derived from this to promote sales of their advertised brands and reduce prices of private labels.

2. A great majority of the 18 Japanese exporting firms which do not handle name brands are being driven into a difficult situation by price cuts on private labels carried out by their U. S. competitors.

3. Under the new sales structure established by the Japan Canned Tuna Sales Company, whereby a large portion of the adjustment quota is allotted to trading firms submitting large buy orders, some firms handling small volume of exports have begun to force themselves to sell larger quantities so as to acquire a greater share of the adjustment quota. This practice has tended to further disrupt the market for Japanese "off" labels.

4. These developments are progressively ruining the position of Japanese name brand packs in the U. S. market. To maintain prices, it has become necessary to temporarily suspend efforts to expand the market for name brands.

5. In view of the situation wherein the majority of the 18 trading firms is seeking a price reduction at a time when the Sales Company is struggling with an excessive supply of canned tuna, many exporting firms have begun to withhold purchases on the assumption that the Sales Company may likely lower its prices in the future. (Suisan Tsushin, May 24, 1965.)

Editor's Note: The situation with regard to the excessive supply of canned tuna mentioned in (5) above is not expected to improve due to the excellent catches of albacore made off Japan in the pole-and-line summer fishery. Japanese packers were actively buying fish available to them at very low prices, as low as US\$227 a short ton (as of May 27), ranging upwards to \$315 a ton. The fishery usually begins tapering off after early June and ends in July.

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## Japan (Contd.):

**CANNED TUNA PACK,  
MARCH-APRIL 1965:**

Data compiled by the Shizuoka Packers Association reveal that in March and April 1965 its 49 member firms packed a total of 197,292 cases of tuna in oil and 285,351 cases of tuna in brine. Not included was canned skipjack, which totaled about 100,000 cases. Of the above, 109,012 cases of tuna in oil (55 percent) and 284,292 cases of tuna in brine (99 percent) were marked for export. (Kanzume Nippo, June 17, 1965.)

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**U. S. CONSUMER RESPONSE TO  
JAPANESE SPECIALTY-PACK TUNA:**

A study in the New York area to determine consumer response to Japanese canned tuna packed in vegetable (health food) was recently made by the Japan External Trade Promotion Organization (JETRO). Results obtained from that study follow:

Component	Response	Percentage of Response
Appearance	Excellent	13
	Good	37
	Poor	1/50
Taste-flavor	Excellent	29
	Good	42
	Poor	2/29
Smell <sup>3/</sup>	Excellent	49
	Good	39
	Poor	12
Texture	Excellent	4/33
	Good	20
	Poor	5/36
Proportion vegetable to tuna	Just right	64
	Too much vegetable	35
	Too little "	1
Importance as health food	Very important	6/29
	Somewhat important	36
	Not important	35
Desire to buy	Yes	7/39
	No	61

1/Contents appeared spoiled; color too dark and lacked coloring; too oily; does not look like tuna pack.

2/Tasteless; too strongly flavored.

3/Half of samplers impressed by tuna flavor, other half by absence of tuna smell.

4/Soft and tender.

5/Too soft.

6/Low cholesterol content.

7/Of "yes" respondents, 48 percent were under 35 years of age. Most were impressed by unique flavor and said they expect to use the product for salad or casserole, and majority felt 35-40 cents a can was fair price.

Marketing people all showed negative response, saying that the product would not sell in the United States for reasons of taste, flavor, and quality. Further, almost all of them

thought the description of contents on the label unlawful. (Suisan Tsushin, May 31, 1965.)

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**SUMMER ALBACORE POLE-  
AND-LINE FISHERY TRENDS:**

The Japanese summer albacore pole-and-line fishery continued excellent into June 1965, with landings of over 1,000 metric tons almost daily. On June 8, a total of 1,604 metric tons was landed at the three Japanese ports of Yaizu, Shimizu, and Misaki. As of June 10, a total of 33,000 tons were landed at those ports. Ex-vessel prices at Yaizu on June 8 ranged from 93-100 yen a kilogram (US\$234-252 a short ton) for medium (18-24 lbs.) and 77-96 yen a kilogram (\$194-242 a short ton) for under 18-pound fish.

On June 14, a total of 660 metric tons of pole-and-line caught albacore tuna was landed at the Japanese tuna ports of Yaizu and Shimizu. As of that date the total summer fishery catch exceeded 40,000 tons. However, it was reported that about mid-June the catch had fallen off rapidly and unless fishing improved the catch of 50,000 tons forecast earlier might not be reached. Ex-vessel prices at Yaizu on June 14 were 94-100 yen a kilogram (US\$237-252 a short ton) for medium and large fish (over 18 pounds) and 85-95 yen a kilogram (\$214-239 a short ton) for under 18-pound fish. On June 17, ex-vessel prices at Yaizu were up and ranged from 104-117 yen a kilogram (US\$262-295 a short ton) for albacore over 18 pounds and 99-102 yen a kilogram (\$250-257 a short ton) for under 18-pound fish. Compared to early June, ex-vessel prices were up.

The price of frozen round albacore tuna for export to the United States also increased in mid-June from \$270 to \$275 a short ton f.o.b. Japan. The export price was expected to go up to \$280 a ton.

Fishing was excellent in May also, with 23,803 tons landed at the port of Yaizu May 1-15. Including April landings of 4,684 tons, landings at that port April 1-May 15, 1965, totaled 28,487 metric tons. Albacore were landed also at such ports as Shimizu, Misaki, and Nakaminato.

The heavy landings caused a drop in ex-vessel prices to as low as 85 yen a kilogram (US\$214 a short ton) on May 12. High for that day was 120 yen a kilogram (\$302 a short ton).

## Japan (Contd.):

Data published by the Fisheries Agency show April-May 1965 Yaizu landings as the highest ever recorded for that port since 1957 (data prior to 1957 unavailable). A total catch of 50,000 metric tons or more had been forecast for the summer albacore fishery.

Export prices declined, from US\$365 a short ton c. & f. in April to \$345 a ton near mid-May. (Suisan Keizai Shimbun, May 21, June 9, 15, and 18, 1965; Suisan Tushin, June 19, 1965; Fisheries Agency 1965 Fishing Condition Report Nos. 8-10, and 13.)

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## ATLANTIC ALBACORE TUNA FISHING AND MARKET TRENDS, MID-MAY 1965:

The Japanese Atlantic albacore tuna fishery commenced in mid-May 1965, somewhat earlier than usual. Fishing was reported good and daily more vessels were switching to that fishery.

The export price of frozen round Atlantic albacore tuna transhipped to Puerto Rico dropped from the late May price of US\$305 a short ton f.o.b. port of shipment to \$295 a ton in mid-June. (Suisan Tsushin, June 19, 1965.)

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## TUNA INDUSTRY MEMBERS DISCUSS ALBACORE MARKET STABILIZATION:

Members of the Japanese tuna industry representing producers, freezers, packers, and exporters held a meeting at Tokyo on June 16, 1965, to discuss measures to stabilize the albacore tuna export market. It was acknowledged at the meeting that the stabilization of albacore prices was of common benefit to all, but the discussions did not proceed to a point where a study of concrete plans to stabilize prices could be undertaken. Further, no new acceptable plan that could be implemented to cope with the immediate problem resulting from the excellent catches made by the pole-and-line albacore fishery was presented. The consensus of the meeting was that the albacore problem should be examined in its entirety.

In an exchange of views among members of the Atlantic Committee, the majority agreed that Atlantic albacore transshipments

should be held to the 36,000 ton-per-year level. However, due to conflict of interests and to technical difficulties involved in implementing such a quota, the submission of a definite allocation plan was deferred to the next meeting. (Suisan Keizai Shimbun, June 18, 1965.)

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## TUNA MOTHERSHIP FLEET CATCH IN SOUTH PACIFIC:

The catcher vessels of Taiyo Fishing Company's tuna mothership Yuyo Maru (5,043 gross tons), which commenced fishing in the South Pacific near the Fiji Islands in late May 1965, were reported to be averaging two tons per day. As of May 28, the tuna mothership fleet had landed a total of 426 metric tons of fish, consisting of 46 percent yellowfin, 19 percent albacore, 10 percent other tuna species, 17 percent spearfish, and 8 percent miscellaneous fish. (Minato Shimbun, June 3, 1965.)

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## TUNA PURSE-SEINER OPERATION OFF GUAM CANCELLED:

A large Japanese fishing company, which was earlier reported to be planning to dispatch the tuna purse seiner Kenyo Maru (240 gross tons) to survey the waters off Guam in October 1965, was reported to have cancelled its plans. The Kenyo Maru, a converted purse seiner, is the first Japanese fishing vessel to be equipped with a power block (in 1962). (Shin Suisan Shimbun Sokuho, June 22, 1965.)

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## FRESH BLUEFIN TUNA COMMANDS HIGH PRICE:

On June 7, 1965, two metric tons of fresh trap-caught bluefin tuna were landed at Kesennuma, Japan. They brought prices ranging from 13,000-15,000 yen per 10 kilograms (US\$3,280-3,780 a short ton). The tuna, which averaged about 220 pounds in size, were sold to the fresh fish trade. (Nihon Suisan Shimbun, June 14, 1965.)

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## SOVIETS OFFER EXCHANGE OF TUNA FISHING DATA:

The Soviet Union has offered to exchange during 1965 tuna data with Japan. The Soviet offer was made in response to the proposal

## Japan (Contd.):

initiated in 1963 by the Misaki Fisheries Experimental Station in Kanagawa Prefecture that the two countries exchange tuna fishing information. Following receipt of the Soviet offer, the Misaki Station forwarded to the Soviet Government tuna data for 1964. Exchange data from the Soviet Union had not yet been received as of early summer but they were expected to reveal the extent of Soviet interest in, and the type of gear and methods used for, tuna fishing. (Suisan Keizai Shimbun, May 29, 1965.)

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### SALMON FISHING SEASON IN NORTH PACIFIC AREA B SHORTENED DUE TO GOOD FISHING:

Data compiled by the Japanese Fisheries Agency revealed that the salmon catch in North Pacific Area B (south of 45° N. latitude), including the Japan Sea, was better than anticipated, totaling about 44,000 metric tons as of June 18, 1965. Production quota for Area B was 59,000 tons. As a result, the Agency announced that it would close the long-line fishery one week earlier than planned, on June 23 instead of June 30. The Agency also revealed that it would shorten by one week the period in which permits would be issued to gill-net fishing vessels licensed to operate in Area A (between 45° N.-48° N. latitudes). This measure, in effect, would compel gill-netters to terminate their operations in Area B earlier so as to be able to return to port in sufficient time to pick up their permits to fish in Area A. The permit issuing period was changed from June 21-July 10 to June 21-July 3. (Suisan Keizai Shimbun, June 20, 1965.)

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### PINK SALMON CATCH IN JAPAN SEA:

The Japanese pink salmon catch in the Japan Sea was estimated to total 3,000 metric tons as of May 31, 1965. The fishery closed on June 15. Catch quota for that fishery was 3,500 tons. (Minato Shimbun, June 12, 1965.)

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### SALMON PRICE AND PACK TRENDS, MID-JUNE 1965:

The ex-vessel price of pink salmon landed by the Japan-based vessels operating in the North Pacific was holding at the high level of about 260 yen a kilogram (30.5 U.S. cents a

lb.) in mid-June 1965. The pack to that date of canned pink salmon for the export market was estimated at 100,000 cases, consisting of 85,000 cases of the  $\frac{1}{2}$ -lb. pack and 15,000 cases of the  $\frac{1}{4}$ -lb. pack.

At the beginning of the packing season, the land-based packers agreed to provide special incentives for the pack of the  $\frac{1}{2}$ -lb. can and to penalize for the packing of the  $\frac{1}{4}$ -lb. can so as to avoid the situation in 1964 when packers concentrated on putting up the smaller pack. This measure has resulted in making it more profitable to put up the  $\frac{1}{2}$ -lb. size despite high ex-vessel prices. (Suisan Tsushin, June 21, 1965.)

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### CANNED SALMON EXPORT PRICES FOR 1965 SET:

The Japan Canned Salmon Sales Company, following a meeting on June 21, 1965, announced that it was setting the c.i.f. export price of canned red salmon for cases of 48  $\frac{1}{2}$ -lb. cans for shipment to Great Britain as follows: July shipment--155 shillings (US\$21.70); August-October shipment--156 shillings (\$21.84); November-December shipment--158 shillings (\$22.12). In 1964 the first shipment was sold for 153 shillings and 6 pence (\$21.49). Prices in 1964 averaged 155 shillings (\$21.70). (Suisan Tsushin, June 22, 1965.)

\* \* \* \* \*

### FIRMS CONTRACT FOR EARLY DELIVERY OF CANNED SALMON TO GREAT BRITAIN:

Two Japanese fishing firms (which operate salmon factoryships) formally contracted to ship in late June 1965 a total of 200,000 cases of canned salmon to Great Britain. The firms plan to transship their products from the fishing grounds directly to Great Britain, thereby cutting down shipping time by 30 days. Under the old system whereby the factoryship-packed salmon were unloaded in Japan, inspected, reloaded, and then shipped, the trip took over 65 days. (Suisancho Nippo, June 5, 1965.)

\* \* \* \* \*

### CANNED SALMON TO BE SHIPPED DIRECT TO GREAT BRITAIN FROM FISHING GROUNDS:

A large Japanese fishing company has chartered the cargo vessel Yumishima Maru (1,941 gross tons) for hauling direct from the fishing

## Japan (Contd.):

grounds to Great Britain, 100,000 cases of canned salmon packed by its salmon mother-ship fleet operating in the North Pacific. The Yumishima Maru left Yokohama on June 10, 1965, to rendezvous with the salmon fleet.

Another fishing company also chartered a vessel to pick up 100,000 cases of salmon on the high seas for delivery to Great Britain. That cargo vessel was scheduled to leave Yokohama for the North Pacific around June 20. (Suisan Keizai Shimbun, June 17, 1965.)

\* \* \* \* \*

### SALMON FISHERMEN NEGOTIATE NEW WAGE CONTRACT:

The Shiogama (Miyagi Prefecture) Chapter of the Japan Seamen's Union has concluded a new wage agreement with the Miyagi association representing owners of salmon catcher vessels engaged in the mothership-type salmon fishery. On the basis of this agreement, all of the chapters of the Seamen's Union in the northeastern prefectures, except Yamagata, have negotiated new wage contracts, as of May 17, 1965. The agreement sets the following pay scale:

#### Base Pay and Guaranteed Bonus:

Position	Base Pay		Minimum Guaranteed Bonus		Bonus Shares
	Yen	US\$	Yen	US\$	No.
Skipper-fishing captain	39,000	108.33	9,750	27.08	2.0
Fishing captain	36,000	100.00	9,000	25.00	2.0
Skipper, chief engineer, chief radio operator	30,000	83.33	7,500	20.83	1.5
Deck chief, first mate	24,000	66.67	6,000	16.67	1.2
Deck crew	18,000	50.00	4,500	12.50	1.0

#### Bonus for Crew:

Value of Catch 1/		Bonus Allocation
Yen	US\$	Percent
Under 15 million	Under 41,667	7.1
15-20 million	41,667-55,556	17.0
Over 20 million	Over 55,556	24.0

1/ Represents value of catch delivered by catcher vessel to mothership after deducting certain expenses shared with mothership operator, such as costs of operating scout vessels and salmon hatcheries.

#### Daily Sea Duty Allowance:

The amount of payment of daily sea duty allowance varies according to level of base

pay and area of operation. A total of five operational areas have been established, with payments ranging as follows for each level of base pay:

Base Pay		Range of Daily Allowance	
Yen	US\$	Yen	US\$
15,000-18,000	41.67-50.00	120-400	0.34-1.11
18,000-25,000	50.00-69.44	150-510	0.42-1.42
25,000-35,000	69.44-97.21	180-620	0.50-1.73
Over 35,000	Over 97.21	220-730	0.62-2.02

The agreement also stipulates payment of disaster compensation to crew members under the Seamen's Law or under insurance coverage to be provided by the vessel owner; compensation for personal property losses up to an amount equaling over one but less than two months' wages; and payment of up to three months' wages to the surviving family of a crew member found missing in line of duty, payment to stop upon confirmation of safety or death of the missing person. (Suisan Keizai Shimbun, May 23, 1965.)

\* \* \* \* \*

### PACK AS OF JUNE 24 OF TWO KING CRAB FACTORYSHIPS IN BRISTOL BAY:

The two Japanese king crab factoryships (Tokei Maru, 5,385 gross tons, and Tainichi Maru, 5,859 gross tons) operating in Bristol Bay had packed a total of 88,766 cases of crab meat as of June 5, 1965. Catch per unit of effort was reported to be 9.9 crabs per shackle and yield 22.4 crabs a case.

By June 24 the two vessels had packed 112,584 cases of king crab, equal to 61 percent of their combined production quota of 185,000 cases. They were averaging 11.5 crabs per shackle and 22.5 crabs per case. (Nihon Suisan Shimbun, June 11; Suisan Tsushin, June 28, 1965.)

\* \* \* \* \*

### ELEVEN TRAWL FLEETS LICENSED TO FISH IN GULF OF ALASKA:

The Japanese Fisheries Agency formally announced on June 1, 1965, the names of the 11 trawl fleets that will be licensed to conduct operations in the Gulf of Alaska on a commercial basis. Previously the operation of vessels in the Gulf was licensed only on an experimental basis.



## Japan (Contd.):

Following is the composition of the licensed Japanese Gulf of Alaska trawl fleet as reported by Suisan Keizai Shimbun, June 2, 1965:

Mothership (Gross Tons)	Catcher Vessel (Gross Tons)
Akebono Maru No. 53 (1,450)	Nisshin Maru No. 50 (263)
Daishin Maru No. 12 (2,967)	Fukushin Maru No. 1 (299)
Sumiyoshi Maru No. 12 (578)	Kintoku Maru No. 7 (298)
Taiyo Maru No. 61 (1,496)	Dairin Maru No. 8 (204)
Taiyo Maru No. 82 (2,886)	Taiyo Maru No. 36 (372)
Takachiho Maru (3,470)	Taiyo Maru No. 37 (372)
Tatsuta Maru (560)	Fukuho Maru No. 2 (299)
Tokachi Maru (2,530)	Fukuho Maru (276)
Undesignated (2,000)	Omi Maru (291)
" (1,500)	Kyowa Maru (246)
" (1,499)	Undesignated (300)
	Kohoku Maru No. 2 (295)

Editor's Note: The Japanese Central Fisheries Coordination Council (supreme government-industry fisheries advisory group) had previously approved the licensing of the trawl fleets in the Gulf of Alaska subject to the following limitations:

Halibut, salmon, and king crab will not be taken. Those taken incidentally will be returned to the sea immediately. Catch of herring under 20 centimeters (7.9 inches) must not exceed in numbers 10 percent of the total catch of herring. Should it exceed 10 percent, vessels must immediately move away from the area. Marine plants and animals must not be taken in waters within three miles off foreign territory. The possession on board vessels of long lines and gill nets is illegal. The responsible person on board the vessel must report to the government inspector the vessel's daily catch in accordance with provisions to be stipulated separately.

\* \* \* \* \*

### THREE BOTTOMFISH FLEETS SAILED IN MAY FOR EASTERN BERING SEA:

Japanese licensed bottomfish fleets which sailed in May 1965 to begin operations in the eastern Bering Sea included:

(1) The factoryship Itsukushima Maru (5,871 gross tons) accompanied by 18 catcher vessels ranging from 61 to 113 gross tons--departed Japan, May 17, 1965. Of the 18, 14 are combination trawl-gill net-long line vessels and 4 are combination gill net-long line vessels.

(2) The factoryship Seifu-Mar (8,331 gross tons) accompanied by 23 catcher vessels ranging from 48 to 167 gross tons--departed May 12, 1965. The fleet was to fish mainly for herring.

(3) The factoryship Soyo Maru (11,193 gross tons) accompanied by 21 catcher vessels ranging from 62 to 139 gross tons--departed May 15, 1965.



Fig. 1 - Looking forward on deck of Japanese factoryship Soyo Maru. Note conveyor in left foreground and sorters at right.



Fig. 2 - Japanese factoryship Tenyo Maru in Bering Sea.



Fig. 3 - Hoyo Maru, Japanese fish meal factoryship, in Bering Sea.

## Japan (Contd.):

All the licenses for the listed factoryships expire January 31, 1966.

Japanese factoryship sailings in April 1965 for the Bering Sea included the Tenyo Maru (11,581 gross tons) with 10 catcher vessels to fish mainly for Alaska pollock for conversion into minced fish; the fish meal factoryship Gyokuei Maru (10,357 tons); the factoryship Kotoshiro Maru No. 15 (700 tons); the fish meal factoryship Hoyo Maru (14,111 tons); and the shrimp factoryship Einin Maru (7,482 tons). (Fisheries Attache, United States Embassy, Tokyo, May 25, 1965, and other sources.)

\* \* \* \* \*

# ATLANTIC OCEAN TRAWL FISHERY PRODUCTION TRENDS:

The Japanese Government has scheduled a meeting for June 18, 1965, of the Central Fisheries Coordination Council (highest government-industry advisory board) to discuss the licensing of additional trawlers for the Atlantic Ocean. In preparation for that meeting, the Japan Overseas Trawlers Association has prepared data showing production trends

Japanese Atlantic Ocean Trawl Fishery Production, 1959-65				
Year	No. Vessels	Total Catch	No. Tows	Catch/Tow
		Metric Tons		Metric Tons
1965 <sup>1/</sup>	45	34,599	23,226	1.55
1964	45	122,406	68,667	1.78
1963	34	92,084	48,938	1.88
1962	27	49,133	28,479	1.73
1961	15	27,952	16,370	1.71
1960	8	6,380	4,533	1.41
1959	2	802	831	.98

<sup>1/</sup>January-March 1965.

for 1959-65. They show that the Atlantic trawl fleet has expanded rapidly from 2 to 45 vessels in 7 years, and production reached a peak in 1964, but catch per tow has steadily declined since 1963. (Suisan Tsushin, June 14, 1965.)

\* \* \* \* \*

# LICENSING DEFERRED OF ADDITIONAL TRAWLERS FOR ATLANTIC OCEAN:

The Japanese Central Fisheries Coordination Council (highest government-industry advisory board), at a meeting on June 18, 1965, deferred the matter of licensing additional trawlers for operation in the Atlantic Ocean until its next meeting. The Fisheries Agency,

which reportedly hopes to newly license 22 vessels of 500 tons each, has been instructed to carry on discussions with other concerned ministries and industry organizations and to seek an adjustment of views. (Suisan Tsushin, June 21, 1965.)

\* \* \* \* \*

# NEW STERN TRAWLER TO FISH OFF WEST AFRICA:

A Japanese firm's newly constructed 1,500-ton stern trawler, Daishin Maru No. 16, was scheduled to depart on her maiden voyage for the trawling grounds off West Africa on June 26, 1965. The trawler, which has a complement of 54 men, is the fourth vessel of that size to be constructed by the firm since January 1962. In addition, the firm operates the 2,967-ton trawler Daishin Maru No. 12, constructed in September 1963. (Minato Shimbun, June 16, 1965.)

\* \* \* \* \*

# CANNED SHRIMP EXPORTS, APRIL 1965:

Japan's exports of canned shrimp in April 1965 of only 621 cases (24  $\frac{1}{2}$ -lb. cans) were down sharply from the 11,032 cases the previous month. In April 1964, exports were 42,684 cases. Only 180 cases were shipped to the United States in April 1965, with the remainder shipped to unspecified countries rather than to Great Britain and Canada which had been among the bigger buyers.

According to Japan's Canned Crab Sales Company (sales agent for canned shrimp), the sharp decline was caused by Japan's poor shrimp production in the North Pacific and low inventories of the 1964 pack. (Fisheries Attache, United States Embassy, Tokyo, June 3, 1965.)

\* \* \* \* \*

# PLANS TO IMPORT SOUTH AFRICAN CANNED SARDINES:

Three Japanese firms are proceeding with plans to import from South Africa about 20,000 cases of seasoned canned sardines. South Africa is said to have agreed to put up the special pack. Japan is faced with a critical shortage of that pack due to several years of poor sardine fishing. (Suisan Tsushin, June 21, 1965.)

\* \* \* \* \*

## Japan (Contd.):

MARINE FISHERY PRODUCTION, 1964:

The 1964 Japanese marine fishery production totaled 5.87 million metric tons, declining below the 6.0-million-ton level for the first time since 1960, according to data released by the Ministry of Agriculture and Forestry. Compared to 6.2 million tons produced in 1963, the 1964 production represents a 5-percent decrease.

Japanese Marine Fishery Production by Leading Fisheries, 1964 with Comparisons		
Fishery	1964	1963
	... (Metric Tons) ...	
Surrounding net . . . . .	1,020,000	910,000
Medium-type trawl . . . . .	740,000	600,000
Tuna pole-and-line and long line . . . . .	680,000	690,000
Distant-water trawl . . . . .	590,000	450,000
Ise <sup>1/</sup> trawl . . . . .	300,000	350,000
Gill-net (excludes salmon) . . . . .	250,000	180,000
Squid . . . . .	240,000	580,000
Small-type trawl . . . . .	230,000	210,000
Saury . . . . .	220,000	370,000
Mackerel pole-and-line . . . . .	140,000	150,000
<sup>1/</sup> Waters west of 130° E. longitude, primarily East China Sea.		
<sup>2/</sup> Estimated catch.		



Fig. 1 - Japanese fishing vessels fish in all the world's oceans.



Fig. 2 - Small fishing village near Ito, Japan.



Fig. 3 - Yellowtail bunched in the net are hauled into the fishing boat on Kumanonada fishing grounds, noted as one of Japan's three largest fishing areas.

The decline in 1964 was primarily due to the low catches made in the saury and squid fisheries. Their combined total production fell by about 500,000 metric tons, from 950,000

## Japan (Contd.):

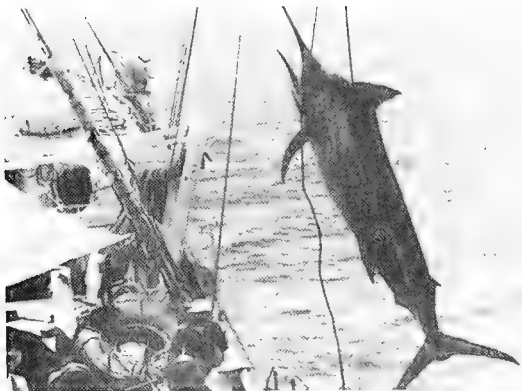


Fig. 4 - A swordfish being hauled aboard a Japanese catcher boat.

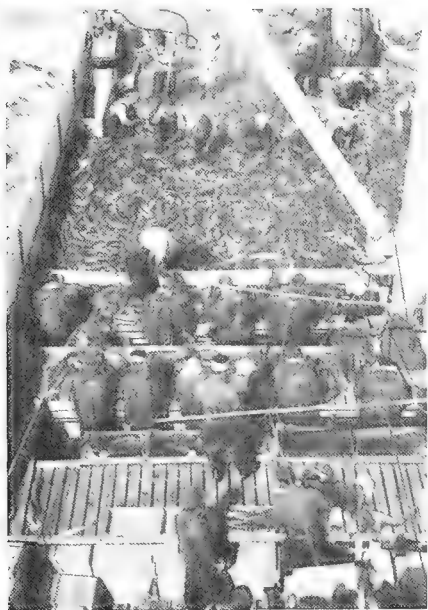


Fig. 5 - Processing fish aboard a factoryship operating in gill-net fishery for bottomfish in Gulf of Alaska.

tons in 1963 to 440,000 tons in 1964. The tuna long-line and pole-and-line fisheries catch decreased slightly, from 690,000 tons in 1963 to 680,000 tons in 1964. This marks the second successive decrease in tuna catch since 1962, when a record 720,000 tons was landed. A 30-percent production increase was achieved in the distant-water trawl fishery, from 450,000 to 590,000 tons. The increase includes 430,000 tons (1963 production was 340,000 tons) produced by the mothership-



Fig. 6 - Setting sunken gill nets from stern of a catch boat in fishery for bottomfish in Gulf of Alaska.



Fig. 7 - Deck of a Japanese fish-meal factoryship in the North Pacific.

type fishery in the "northern waters" (North Pacific and Bering Sea). The gill-net fishery (excluding salmon gill-net fishery) registered a 40-percent increase over 1963, from 180,000 tons to 250,000 tons. The increase was mainly in the catch of Alaska pollock. (Suisan Keizai Shimbun, June 2, 1965.)

Notes: (1) Does not include shellfish, aquaculture, seaweed, oysters, whaling, and several other minor fisheries.

(2) See Commercial Fisheries Review, Sept, 1964 p. 78; Sept. 1963 p. 78.

\* \* \* \* \*

#### OVERSEAS FISHERIES PROBLEMS:

Following is a report published in Nihon Keizai, May 18, 1965, describing Japanese fisheries problems at overseas bases and on the high seas:

Stagnation threatens Japanese overseas fisheries because of (1) disappointing results

## Japan (Contd.):

from joint foreign ventures; (2) declining yields from high seas fisheries; and (3) foreign competition and restrictions which limit Japanese operations.

Joint Foreign Ventures: Japanese joint ventures with foreign interests have included: (1) fishing bases in the Netherlands Antilles, Malaysia, New Hebrides, and New Caledonia; (2) cold-storage plants in Brazil and Nigeria; (3) whaling operations with Brazil and Canada; (4) tuna fisheries with the Ivory Coast, Argentina, and Italy; and (5) trawl fisheries with Argentina, India, and the Bahamas.

Problems encountered in joint ventures have included: (1) foreign partners with insufficient capital and fisheries experience; (2) limitations on Japanese participation; (3) political instability; and (4) inflation. Those problems have made the outlook for such ventures less bright, although both Japanese and foreign groups continue to show interest in joint enterprises.

Distant-Water Fisheries: In addition to carrying out joint ventures with foreign interests, Japan sends self-supporting fishing fleets to many parts of the world. A declining catch rate has been a disturbing factor in a number of distant-water operations. Such declines have been experienced for some time in Antarctic whaling, South Pacific tuna fishing, and North Pacific salmon fishing. Now, declining catch rates are being reported in Japanese overseas trawl fisheries, particularly on the rich West African grounds where the average daily catch of a Japanese trawler of 1,500 to 2,500 tons has dropped from 20 metric tons to 10 tons and lower.

In the field of overseas trawling, Soviet vessels are said to be making inroads on resources fished by the Japanese. In the South Pacific tuna fisheries, Japan is facing increasing competition from the growing fishing fleets of South Korea and Taiwan. Another problem is the gradual increase in restrictions arising from the extension of territorial waters and fishing limits. Under the circumstances, voices are being raised in the Japanese fishing industry calling for a review of Japanese overseas fisheries policies.

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# TEMPERATURES OF WATERS SURROUNDING JAPAN CONTINUE BELOW NORMAL:

Ocean conditions off Japan were again reported below normal in 1965 and like those of the previous two years. Surveys conducted in April show that water temperatures in the Pacific Ocean, Japan Sea, East China Sea, and Yellow Sea are 1° to 3° C. (1.8° to 5.4° F.) colder than normal. Japanese fishery research laboratories have been monitoring the effect that the low water temperatures may have on fishing. The greatest concern expressed is that mackerel fishing off northeastern Japan and in the Japan Sea, as in the past two years, may be adversely affected. (Nihon Suisan Shimbun, May 10, 1965.)

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# RADIATION PRESERVATION OF FISH UNDER STUDY:

The Japanese Tokai Regional Fisheries Research Laboratory is studying ways to extend the storage life of fish by combining radiation sterilization with refrigerated storage. The Laboratory is trying to establish conditions for sterilization of clams for export that can be used by exporters to overcome the problem of claims made by overseas buyers.

For the domestic market, it is thought that pasteurization of fishery products with low-dose radiation would have the best chance of consumer acceptance. The Japanese people are accustomed to eating raw fish and would be very sensitive to even the slightest change in flavor resulting from irradiation.

In February 1965 a council for irradiated food studies was set up, bringing together the research organizations in the Kanto Area to analyze Japanese technical problems. The council meets once a month and is open to all researchers. At the meetings, research results and information are exchanged. It is reported that a similar council will be set up in the Kansai District of Japan. (Food Irradiation, Vol. 5, No. 3, January-March 1965.)

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# FISHING VESSEL EXPORTS:

Data compiled by the Japanese Fisheries Agency reveal that in fiscal year 1964 (April 1964-March 1965) a total of 57 used fishing vessels was exported. Countries to which the

## Japan (Contd.):

used vessels were exported were: Philippine Islands 25; South Korea 15; Ryukyu Islands 10; Formosa 4; Nigeria 2; and Greece 1. They included 5 vessels exported to the Philippines as payment for reparation, but not the newly constructed 144-ton class tuna vessels exported to the Republic of Korea (ROK) as refrigerated carrier vessels. A total of 11 of those tuna vessels (completed in 1964) was specially approved in February 1965 for export to South Korea to help expedite the ROK-Japan negotiations to normalize relations. The treaty was signed June 23, 1965.

In FY 1963 Japan exported 49 used and 7 new vessels; FY 1962, 69 used and 4 new vessels; and in FY 1961, 45 used and 10 new vessels. (Suisan Keizai Shimbun, June 16, 1965, and other sources.)

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#### FISHING VESSEL CONSTRUCTION TRENDS AS OF MAY 1965:

A Japanese fishery guidance vessel constructed with aluminum alloy parts was recently completed. The 495-ton vessel, named Chiba Maru, built for the Chiba Prefectural Government, employs aluminum alloy in its fishhold, portholes, doors, radar mast, compass support, and railings. She is the first Japanese fishing vessel to make extensive use of this light, durable metal (Minato Shimbun, May 30, 1965.)

A 19-gross-ton plastic fishing vessel, the first of its kind in Japan, was recently completed by a Japanese firm. The vessel, named Fujiura Maru No. 3, was designed as a portable boat to be deck-carried on a large fishing vessel. The greatest advantage of this plastic vessel is that it weighs 5-6 tons less than a comparable steel vessel and has much less rolling motion than a wooden vessel. Delivery price is reported to be 17,260,000 yen (US\$47,944). (Hokkai Shimbun, June 7, 1965.)

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#### FISHING VESSEL CONSTRUCTION TRENDS, FISCAL YEAR 1964:

According to data compiled by the Japanese Fisheries Agency, 931 fishing vessels (including research and carrier vessels) totaling 128,488 gross tons were built in fiscal year 1964 (April 1964-March 1965). Compared to fiscal year 1963, it is a decline in

vessel construction of 141 vessels and an increase in tonnage of some 4,563 tons. Steel vessels built in 1964 numbered 502 (639 vessels in 1963) totaling 110,680 gross tons, and wooden vessels 429 totaling 17,808 gross tons.

Steel Vessel Construction for Some Japanese Fisheries,  
Fiscal Years 1964 and 1963

Fishery	No. of Vessels		Tonnage	
	FY 1964	FY 1963	FY 1963	FY 1963
Distant-water trawl . .	36	14	41,699	17,576
East China Sea trawl . .	61	101	6,441	10,361
Offshore trawl . . . .	56	33	4,800	3,064
Tuna . . . . .	136	297	29,595	58,657
Purse seine . . . . .	45	39	4,132	3,313
Salmon gill-net . . .	71	57	6,457	5,257

Tuna vessel construction showed the greatest decline: In fiscal year 1963--297 vessels and in fiscal year 1964--136 vessels. The decline was due primarily to inactivity of the tuna long-line fishery and the drop in construction of new larger vessels as replacements for existing vessels. There was a noticeable drop in the construction of 100- to 300-ton vessels, which normally make up the bulk of Japanese tuna vessel construction. The construction of wooden tuna vessels under 50 tons increased. This was attributed to the Government's action in establishing the coastal tuna fishery off Japan as a licensed fishery for vessels in the 20- to 50-ton category. Previously, vessels under 39 tons did not require licenses. (Suisan Keizai Shimbun, May 9, 1965.)

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#### REFUELING VESSELS AT SEA PLANNED FOR ATLANTIC OCEAN:

A Japanese firm is planning on conducting high-seas refueling operations starting July 1965 to supply fuel to Japanese tuna vessels operating in the Atlantic Ocean. The firm planned to use the 900-ton tanker Shotoku Maru for that purpose, which was scheduled to depart Japan in mid-June.

In addition, the Shotoku Maru will supply drinking water, provisions, and other supplies to the fishing vessels, as well as provide medical service if plans to station a medical doctor aboard the tanker materialized. Similar high-seas refueling and supplying operations were successfully conducted in the Pacific Ocean in 1963 and 1964 by the Japan National Federation of Tuna Fishermen's Cooperative Associations. (Suisan Keizai Shimbun, May 27, 1965, and other sources.)

Note: See Commercial Fisheries Review, January 1964 p. 56.

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## Japan (Contd.):

**ANTARCTIC WHALING FLEET FOR 1965/66 SEASON REDUCED:**

At the special whaling conference held in London in early May 1965, the International Whaling Commission agreed to reduce the Antarctic whale catch quota to 4,500 blue-whale units for the 20th Whaling Expedition (1965/66 season). Following that conference, the Japanese whaling firms participating in the expeditions conferred on ways of satisfactorily reducing their whale fleets and consolidating their operations. On May 21 they reached an agreement and announced that for the 20th Expedition 2 of the firms will each operate 2 fleets and the third firm will operate 1 fleet. In the 19th Expedition one of the firms operated 3 fleets and another firm operated 2 fleets.

On May 26 the Japanese Fisheries Agency announced that one of the whaling companies had been instructed to consolidate its whaling operation by eliminating its unprofitable coastal whaling operation and beginning this year its South Georgia Island base operation. At the same time, the Agency increased that firm's northern water whale catch quota by 200 blue-whale units. (*Suisan Keizai Shimbun & Suisan Tsushin*, May 27, 1965.)

Note: See *Commercial Fisheries Review*, July 1965 p. 78.

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**WHALE OIL PRODUCTION BY ANTARCTIC LAND STATIONS AS OF JANUARY 1965:**

Four Japanese whaling companies operating land stations (Leith Harbor and Grytviken in South Georgia) in Antarctica landed 280.3 blue-whale units, 84 sperm whales, and 5,147 seals during September 18, 1964-January 26, 1965. Production of oil from the catch totaled 5,300 metric tons of baleen oil, 680 tons of sperm oil, and 1,650 tons of seal oil.

The entire Japanese output was sold under contract to European buyers, principally in the United Kingdom. The sales price for baleen oil was US\$232.40 to \$236.60 a metric ton c.i.f., and seal oil at \$224.

Three of the four Japanese companies terminated operations on December 3, 1964; the fourth continued whaling operations through March 1965.

The land stations in South Georgia were also leased by Japanese companies in the 1963/64 season. During that period, the catch totaled 341.2 blue-whale units and 60 sperm whales. Production of baleen oil amounted to 6,501 tons and production of sperm oil 517 tons. (*Foreign Agriculture*, U. S. Department of Agriculture, March 22, 1965.)

Note: See *Commercial Fisheries Review*, June 1965 p. 45.

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**ANTARCTIC WHALE OIL AND SPERM OIL PRODUCTION, 1964/65 SEASON:**

Total marine oil production from Japanese whaling in the Antarctic during the 1964/65 season was down about 11 percent from the previous season.

Japanese whale oil output from the 1964/65 Antarctic catch totaled 534,370 barrels (about

Japanese Antarctic Production of Whale Oil and Sperm Oil by Whaling Fleets and Shore Stations During the 1964/65 Season <sup>1/</sup>			
Producing Unit	Whale Oil	Sperm Oil	Total Whale and Sperm Oil
	..... (Barrels <sup>2/</sup> ) .....		
<b>Whaling Fleets:</b>			
<i>Kyokuyo 2</i> .....	81,077	9,547	90,624
<i>Kyokuyo 3</i> .....	76,547	7,959	84,506
<i>Nisshin</i> .....	73,676	6,835	80,511
<i>Nisshin 2</i> .....	74,324	-	74,324
<i>Nisshin 3</i> .....	41,382	29,435	70,817
<i>Tonan</i> .....	76,335	6,129	82,464
<i>Tonan 2</i> .....	72,000	6,247	78,247
Total whaling fleets ..	495,341	66,152	561,493
<b>Shore Stations:</b>			
Leith Harbour .....	24,235	5,071	29,306
Grytviken .....	14,794	1,706	16,500
Total shore stations ..	39,029	6,777	45,806
Total whaling fleets and shore stations .....	534,370	72,929	607,299
<sup>1/</sup> Preliminary.			
<sup>2/</sup> Six barrels equal approximately one long ton.			
Source: <i>The Norwegian Whaling Gazette</i> , No. 4, 1965.			



Fig. 1 - Japanese catcher boat towing a whale.

## Japan (Contd.)



Fig. 2 - Japanese whale catcher in Bay at Leith Harbour, Japanese land station at South Georgia Island in the Antarctic.

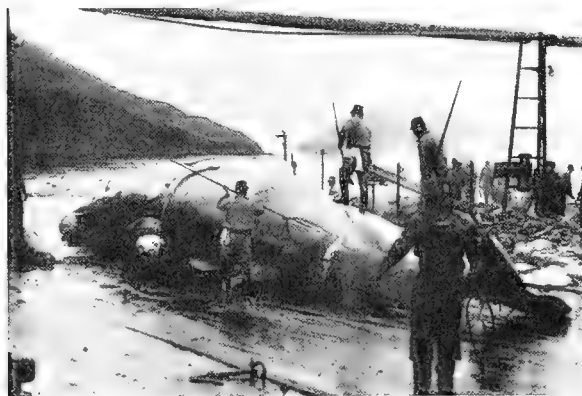


Fig. 3 - Whale being hauled on shore at Leith Harbour.



Fig. 4 - Stripping blubber from whale, Leith Harbour.

89,000 long tons) as compared with production in 1963/64 of 561,035 barrels (93,500 tons).

Sperm oil output in 1964/65 was 72,929 barrels (12,150 tons) as compared with production in 1963/64 of 120,093 barrels (20,000 tons).

The Japanese 1964/65 Antarctic whale catch totaled 4,125 blue-whale units. That was only 35 units short of the Japanese quota for 1964/65, but a decline of about 10 percent from the previous season's catch of 4,600 blue-whale units. (United States Embassy, Copenhagen, May 18, 1965.)

Note: See Commercial Fisheries Review, June 1965 p. 44, March 1965 p. 83, Oct. 1964 p. 49.

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### THREE WHALING FLEETS SAILED FOR NORTH PACIFIC IN MAY:

The three Japanese whaling fleets licensed to take whales in the North Pacific and Bering Sea sailed from Japan, May 20, 1965.

One fleet consists of the mothership Nisshin Maru No. 3 (23,405 gross tons) accompanied by 7 catcher and scout vessels (1 of which is listed as a "research-whale towing vessel") ranging from 622 to 758 tons. The fleet has a catch target of 1,640 sperm whales, according to previous reports.



Flensing a sperm whale aboard a Japanese whaling factoryship in the North Pacific.

Another fleet consists of the mothership Nichiei Maru (12,918) accompanied by the carrier vessel Nojima Maru (8,815 tons) and 7 catcher and scout vessels (1 listed as a "research-whale towing vessel") ranging from 470 to 753 tons.

The third fleet consists of the mothership Kyokuyo Maru (11,449 tons) accompanied by the tanker Kyokuyo Maru No. 2 (16,443 tons), the carrier vessels Kyokurei Maru (9,943 tons) and Koyo Maru (7,658 tons), and 7 catcher vessels ranging from 618 to 738 tons. According

## Japan (Contd.):

to earlier reports, the catch target of the Kyokuyo Maru fleet is 534 blue-whale units (30 blue whales, 680 fin whales, and 1,200 sei whales).

The licenses of all three fleets expire December 31, 1965. (Fisheries Attache, United States Embassy, Tokyo, May 25, 1965, and other sources).

\* \* \* \* \*

## FISH OIL PRODUCTION, 1956-1964:

Japanese estimated production of fish-body oil totaled 10,900 metric tons in 1964, a decline of 27 percent from 1963 due mainly to lower production of saury oil. Japanese production of saury oil has declined sharply from the high levels of the late 1950's.

178-foot mothership, and a smaller special vessel was handed over to the Kuwait National Fishing Company by a Norwegian shipyard at Bergen in May 1965. On its trip to the Persian Gulf the fleet was manned by Norwegians.

The cost of the complete fleet was US\$2.8 million, fully equipped with both navigational and fish-finding equipment and fishing gear. The Norwegian shipyard worked out the fisheries program for the Kuwait firm, planned the most suitable types of vessels for the Kuwait fisheries, designed them specially for that purpose, and handled the recruitment of Norwegian crews for them. Vessel captains are Norwegian and key crew positions are manned also by Norwegians.

The trawlers are 88 feet long and equipped with modern freezing equipment. The

Japanese Production of Fish-Body Oil, Liver Oil, and Squid Oil, 1956-1964

Type of Oil	1964	1963	1962	1961	1960	1959	1958	1957	1956
	(Metric Tons)								
<b>Fish-Body Oil:</b>									
Sardine	300	578	838	928	631	832	2,610	2,164	926
Herring	-	1	8	31	12	133	10	44	618
Atka mackerel	1,800	864	681	2,372	556	869	115	406	761
Saury	2,800	7,685	18,877	11,032	7,045	24,482	20,044	10,998	6,972
Flounder	-	73	100	171	280	413	476	510	685
Other fish-body oils	6,000	5,789	7,958	5,701	5,194	4,681	3,178	2,171	1,684
Total fish-body oil	10,900	14,990	28,462	20,235	13,718	31,410	26,433	16,293	11,646
Squid oil	1,000	2,663	3,181	2,967	2,720	4,871	4,056	4,170	3,470
<b>Fish-Liver Oil:</b>									
Cod & Alaska pollock	7,500	6,026	7,771	6,743	6,198	6,618	3,686	4,728	4,035
Shark	1,000	1,266	2,201	2,247	3,831	3,222	2,514	3,743	3,212
Other fish-liver oils	200	269	717	1,657	1,081	1,600	409	325	432
Total fish-liver oils	8,700	7,561	10,689	10,647	11,110	11,440	6,609	8,796	7,679
Grand total	20,600	25,214	42,332	33,849	27,548	47,721	37,098	29,259	22,795

1/Estimated.

Source: Japanese Ministry of Agriculture & Forestry.

Japanese estimated production of fish-liver oil in 1964 totaled 8,700 tons. That was a gain of 15 percent over the previous year due to greater production from cod and Alaska pollock. Japanese output of other fish-liver oils continued to decline in 1964. Squid oil production was also down. (Fisheries Attache, United States Embassy, Tokyo, May 28, 1965.)



## Kuwait

## SHRIMP VESSELS DELIVERED BY NORWEGIAN SHIPYARD:

A complete fishing fleet consisting of 8 specially built 90-foot shrimp trawlers, a

800-ton mothership, which has a large freezing plant and ample cold-storage facilities, will receive the catch from the trawlers and pack it into larger units, with most of the production going to the United States market. (Press release of the Export Council of Norway and News of Norway, June 10, 1965.)

Note: See Commercial Fisheries Review, July 1964 p. 72.



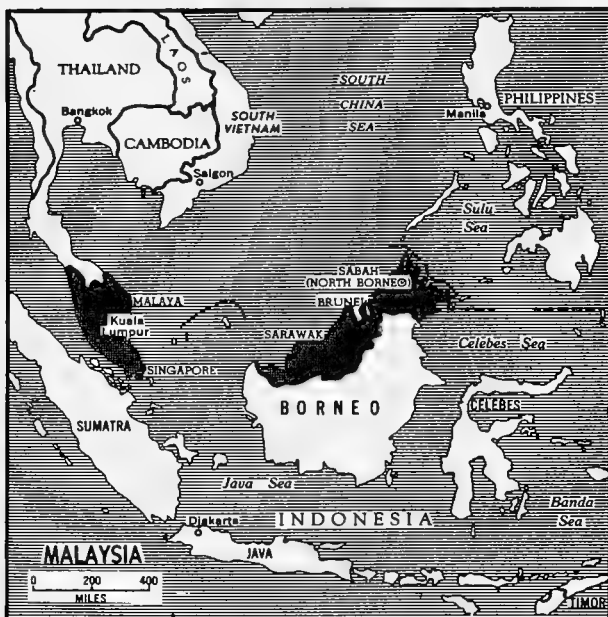
## Malaysia

## FISHERY TRENDS, 1964:

Speaking at the launching of Malaysia's eighth combination fisheries research and patrol vessel on May 8, 1965, the Malaysian

### Malaysia (Contd.):

Minister of Agriculture and Cooperatives announced that the total marine fisheries catch for the States of Malaya in 1964 was up 4.5 percent from 1963. He stated that 192,000 long tons of marine fish valued at M\$162 million (US\$53.1 million) were landed in Malaya in 1964, as compared with 183,630 tons worth M\$157 million (US\$51.5 million) in 1963. He also noted that in 1964 a total of 10,000 tons of fish were landed in Singapore and 20,000 tons in Sabah. There was no fisheries department in the State of Sarawak in 1964, but the Minister said that the Malaysian Government intended to establish an office there in 1965.



Discussing the recent decision to legalize trawling on a restricted basis, the Minister stated that his trip to Thailand in April 1965 had convinced him that it would be a "retrograde step" to continue the trawling ban. He cited the increased Thailand marine landings which have resulted from the use of trawlers (146,500 long tons in 1960 to 332,000 tons in 1963, or an increase of over 125 percent in 3 years).

The Minister said that he realized that the introduction of trawling would meet resistance from many fishermen. He compared trawling, however, to the introduction of "pukat jeroot" (purse-seine nets) on the east coast of Malaya. He said purse seining had been strongly resisted at first, but by 1964 a total of 34 vessels were using the nets in the

State of Kelantan. Those vessels landed 35,000 piculs (4.6 million pounds) of fish or 30 percent of the total catch in Kelantan.

The Minister observed that expansion of fisheries was important to supply protein for the expanding population. He emphasized the need to meet Singapore's demand for fresh fish. He said that Singapore annually imported 31,000 long tons of fresh fish worth M\$19 million (US\$6.2 million), mainly from the States of Malaya, Thailand, and Vietnam. (United States Embassy, Kuala Lumpur, May 21, 1965.)

Notes: (1) Malaysian \$3.05 equal US\$1.00.

(2) See *Commercial Fisheries Review*, April 1965 p. 77; Aug. 1964 p. 67; Feb. 1964 p. 76.



### Morocco

#### LONG-RANGE TUNA FISHING VENTURE CONTINUED:

A fleet of 7 small Moroccan vessels in early 1965 sailed over 2,000 miles from their home port of Agadir to fish for tuna as far south as the Ivory Coast. The venture may be a breakthrough in extending the limited range of Morocco's fishing fleet.

The vessels taking part in the expedition were 50 to 60 feet in length with a hold capacity for 30 to 50 metric tons of fish. That



## Morocco (Contd.):

is a type of vessel normally used in the Moroccan sardine fishery.

For the tuna expedition, the vessels carried purse-seine gear, radiotelephones, electronic fish-finding equipment, and crews of 20 to 25 men.

The Moroccan expedition fished in coastal waters 20 to 36 miles offshore from Dakar (Senegal) and Conakry (Guinea); they also fished off Abidjan in the Ivory Coast. The fleet was said to have been unable to secure permission from Mauritania to fish off Port Etienne.

The total catch of the 7 Moroccan vessels in January-March 1965 was reported by La Vie Economique on April 9, 1965, as 360 metric tons (mostly tuna, mackerel, and anchovy).

By early June 1965, several vessels in the expedition had returned to Morocco, but two of the vessels were reported to be still fishing off Dakar, and others planned to return to Dakar to fish for tuna. (United States Embassy, Rabat, June 3, 1965.)

Note: See Commercial Fisheries Review, July 1965 p. 86.



## New Zealand

## GRANT AWARDED UNIVERSITY FOR PILCHARD RESEARCH:

A grant of £8,000 (US\$22,300) from New Zealand lottery funds has been made to enable scientists from Victoria University to make a survey in Cook Strait to determine the feasibility of establishing a pilchard canning industry in Nelson. The survey is to be conducted by two faculty members of the University, one a biologist in applied fisheries and the other in zoology. It will be the first industrial research in the fisheries field carried out by any of the New Zealand universities.

The survey will be an extension of a study carried out by the New Zealand Marine Department in September 1964, after overseas firms had agreed to establish a canning industry in Nelson if competent biologists reported favorably on the availability of pilchards. The University biologist said the study had revealed considerable quantities of pilchards

in the Cook Strait, Marlborough Sound, and Tasman Bay areas, but precise information was not obtained. He added that the study, however, was sufficiently promising to lead representatives of a British firm to have detailed talks with Nelson industrialists with a view to early establishment of a cannery.

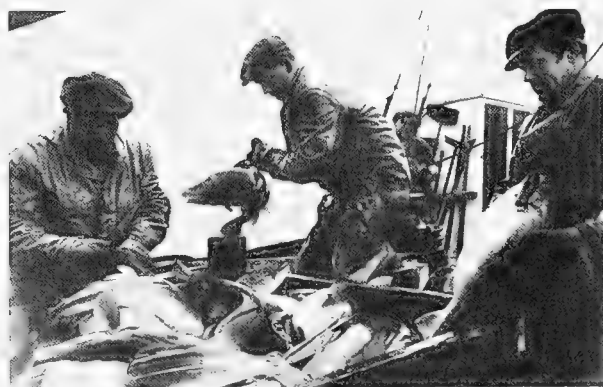
Most of the grant would be taken up by the purchase of a specially designed research steel vessel, but about £1,700 (\$4,700) would be used for gear, especially new types of nets, and about £1,000 (\$2,800) would be used for aerial surveys. The research vessel was expected to be ready by early August 1965. (New Zealand Commercial Fishing, April 1965.)



## Norway

## COD FISHERY AS OF MAY 1965:

As of May 8, Norwegian cod landings in 1965 totaled 65,507 metric tons, of which 20,997 tons were sold for filleting, 23,280 tons for drying, 12,560 tons for salting, and 8,670 tons for marketing as iced fish. The catch also yielded 23,707 hectoliters of cod-liver oil. The Norwegian cod catch in the same period of 1964 totaled about 57,700 tons, of which 11,000 tons were sold for filleting, 23,100 tons for drying, 17,400 tons for salting, and 6,200 tons for marketing as iced fish; the catch yielded 23,214 hectoliters of cod-liver oil.



Norwegian vessel operating in the Lofoten cod fishery--sorting the catch.

As of May 29, Norwegian cod landings totaled 75,166 metric tons, of which 26,216 tons were sold for filleting, 26,817 tons for drying,

## Norway (Contd.):

12,943 tons for salting, and 9,190 tons for marketing as iced fish. The Norwegian cod catch in the same period of 1964 totaled about 62,074 tons--13,143 tons were sold for filleting,

## CANNED FISH EXPORTS, 1963-1964:

Norway's total exports of canned fishery products in 1964 were up about 10 percent in both quantity and value from 1963. The United States was Norway's most important market for canned fishery products, accounting

Table 1 - Norwegian Exports of Canned Fishery Products by Type, 1963-1964

Product	January-December 1964			January-December 1963		
	Quantity	Value		Quantity	Value	
	Metric Tons	1,000 Kroner	US\$1,000	Metric Tons	1,000 Kroner	US\$1,000
Smoked brisling in oil . . .	5,768	38,562	5,386	4,793	32,785	4,579
Smoked brisling in tomato .	1,278	6,978	975	575	3,175	443
Smoked small sild in oil . .	11,077	46,743	6,528	11,478	48,482	6,771
Smoked small sild in tomato	2,154	7,644	1,068	1,447	5,234	731
Unsmoked small sild in oil .	379	1,321	184	869	2,812	393
Small sild packed otherwise	673	2,489	348	61	225	31
Kippered herring . . . . .	3,264	14,370	2,007	3,149	13,442	1,877
Mackerel . . . . .	745	3,606	504	666	3,117	435
Roe, unclassified . . . . .	1,330	5,613	784	1,412	5,132	717
Soft herring roe . . . . .	1,141	5,593	781	719	3,545	495
Fish balls . . . . .	531	1,374	192	581	1,517	212
Other canned fish . . . . .	100	739	103	162	1,212	169
Shellfish . . . . .	1,603	16,393	2,289	1,545	16,486	2,303
Total . . . . .	30,043	151,425	21,149	27,457	137,164	19,156

Table 2 - Norwegian Exports of Canned Fishery Products<sup>1/</sup> by Country of Destination, 1963-1964

Country of Destination	January-December 1964			January-December 1963		
	Quantity	Value		Quantity	Value	
	Metric Tons	1,000 Kroner	US\$1,000	Metric Tons	1,000 Kroner	US\$1,000
Finland . . . . .	269	1,424	198	185	1,187	166
Sweden . . . . .	925	4,330	604	396	2,036	284
Belgium-Luxembourg . . . .	669	3,232	451	649	3,124	436
Ireland . . . . .	298	1,209	168	295	1,087	152
France . . . . .	278	1,121	156	278	1,151	161
Netherlands . . . . .	202	875	122	219	893	125
United Kingdom . . . . .	6,626	32,243	4,503	4,859	21,608	3,018
West Germany . . . . .	899	3,483	486	782	3,012	421
Czechoslovakia . . . . .	1,089	3,871	540	2/	2/	2/
East Germany . . . . .	1,276	4,322	603	1,479	5,295	739
South Africa Republic . . . .	1,740	6,950	970	212	981	137
Iraq . . . . .	88	333	46	1,233	5,126	716
Canada . . . . .	922	5,651	789	922	5,527	772
United States . . . . .	10,479	56,021	7,824	11,900	61,597	8,603
Australia . . . . .	2,144	8,858	1,237	1,947	7,150	999
New Zealand . . . . .	466	2,004	279	503	2,144	299
Other countries . . . . .	1,049	4,327	604	2,186	7,797	1,089
Total <sup>3/</sup> . . . . .	29,419	140,254	19,588	28,045	129,715	18,117

<sup>1/</sup>Does not include exports of canned shellfish.

<sup>2/</sup>Data not available.

<sup>3/</sup>Totals are slightly different than the combined exports of canned fish (excluding shellfish) shown in table 1.

Note: Norwegian Kroner 7.16 equal US\$1.00.

24,832 tons for drying, 17,705 tons for salting, and 6,394 tons for marketing as iced fish.

In late May 1965, the Finmark fishery for young cod off northern Norway was still yielding good results. Norway's Lofoten fishery for spawning cod ended earlier with a disappointing catch of only about 19,500 tons, or a decline of 4,100 tons from the 23,600 tons taken off Lofoten during the 1964 season. (Fiskets Gang, Nos. 16, 17, 18, and 19, and 22, 1965.)

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for 36 percent of total shipments in 1964 and 42 percent in 1963. (Norwegian Canners Export Journal, April 1965.)

Note: See Commercial Fisheries Review, June 1964 p. 53.

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CANNED FISH EXPORTS,  
JANUARY-FEBRUARY 1964-1965:

Preliminary data show that Norway's total exports of canned fishery products in January-February 1965 were up about 10 percent from the same period of the previous year due mainly to larger shipments of smoked small sild.



## Norway (Contd.):

As of March 20, the 1965 Norwegian canned pack of kippered herring totaled 185,254 standard cases, compared with 203,827 standard cases in the same period of 1964.

Norwegian Exports of Principal Canned Fishery Products, January-February 1964-1965		
	Jan. 1-Feb. 27 1965	Jan. 1-Feb. 29 1964
	..... (Metric Tons) .....	
Brisling . . . . .	1,251	1,109
Smoked small sild . .	2,670	2,197
Kippered herring . . .	486	508
Soft herring roe . . .	16	40
Sild delicatessen . . .	95	75
Shellfish . . . . .	186	303
Other fishery products .	332	332
Total . . . . .	5,036	4,564

The 1965 pack of soft herring roe as of March 20 was 10,225 cases of  $\frac{1}{2}$ -ovals and 30,751 cases of  $\frac{1}{4}$ -oblongs, as compared with 16,561  $\frac{1}{2}$ -ovals and 29,136  $\frac{1}{4}$ -oblongs in the same period of 1964. (Norwegian Cannery Export Journal, April 1965.)

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## OPERATIONS OF LARGE FROZEN FISH PACKING FIRM:

In the 1950's an international firm set up a plant to pack frozen fishery products in the Norwegian port of Hammerfest, the northernmost city in the world. Annual production at that plant is now estimated at 8,000 metric tons of frozen fish fillets and 4,000 tons of other processed products such as fish balls, fish sticks, and fish cakes. Cod, haddock, and ocean perch are the main species handled. That pack is marketed all over Europe and even in the United States. The plant also produces about 6,000 tons of animal feed a year, most of which goes to Sweden and Finland.

The company owns 7 modern trawlers and has under annual charter another 15 trawlers of 300 to 500 gross tons. About 600 fishermen work on those 22 trawlers and supply over half of the company's requirements for raw fish. The remainder is supplied by coastal fishermen using smaller vessels.

Quality control is emphasized in all phases of the Hammerfest operation--from fishing to marketing. As soon as fish are caught they are gutted, rinsed, and stowed in ice. Upon landing at Hammerfest, the catch is immediately started on its way through production lines after grading (by an examination of 10 percent of each trawler load) and hand

sorting. Processing is speeded by filleting and skinning machines. Daily production of frozen fillets amounts to about 140 tons or 140,000 consumer packages.

A total of 800 workers are employed in the plant. That includes 500 women production workers who work on a piece-rate basis. Their average hourly earnings are 7 to 9 kroner (US\$0.98 to 1.26).

The Hammerfest operation is considered to be a success and plans for similar operations in other fisheries centers of northern Norway have been reported. (United States Embassy, Oslo, June 10, 1965.)

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## EXPORT OF FISHING VESSELS EXPANDED:

Norway has been rapidly expanding its export business in fishing vessels and equipment, as well as fishery training, and has for some years been building fishing vessels for countries in Asia, Africa, Latin America, and Europe.

Norway's role as an exporter of fishing vessels and fishery training to other countries started with a development aid project in Kerala State in India where she has been active for more than 10 years in teaching modern fishing methods and supplying equipment. Later, Norwegians helped in building a modern fishing industry in Pacific Coast nations of Latin America and were also active in the modernization of the Philippine fisheries. So far, Norway has built two fishing vessels for the Philippines.

Norwegians also have a part in developing the fishing port of Shama in Ghana, with one shipyard now building 7 stern trawlers (231-foot long) for that country. Fishing vessels are also being built for Israel and Scotland (Fair Isles).

Iceland is Norway's biggest foreign customer for fishing vessels. Two Norwegian shipbuilding sales organizations delivered 17 vessels to that country. A third shipbuilding group had not yet released its 1964 export data on fishing vessels for Iceland, but in 1963 sold that country \$4.5 million worth of fishing vessels.

Norwegian shipyards are working actively on the international market and look for more orders for completely equipped fishing fleets for other countries in the Middle East, in Lat-

## Norway (Contd.):

in America, and other parts of the world.  
(Press release of the Export Council of Norway)

Note: See Commercial Fisheries Review, May 1965 p. 67; January 1965 p. 72; August 1964 p. 65.



## Pacific Islands

## FISHERIES TRENDS, EARLY 1965:

Cultured Pearls: The first cultured pearls to be produced in French Polynesia have raised hopes of a new and profitable industry for the islands. The pearls were produced at Bora Bora in the Society Islands and are 10 to 14 millimeters (half an inch or thereabouts) in diameter.

Le Journal de Tahiti describes them as "perhaps the most beautiful in the world." It says their tones, varying from black to green to rose, are "excessively rare in cultured pearls."

Attempts to cultivate pearls in French Polynesia at Bora Bora and Hikueru Atoll in the Tuamotus--have been under way since July 1962 with Japanese know-how and money from FIDES, a French aid scheme.

Meanwhile, in New Guinea, a small raft anchored in a quiet backwater of Port Moresby's Fairfax Harbor is the key to another experiment in pearl production. The raft was anchored there by an Australian company which has successfully been producing cultured pearls by Japanese methods in the Torres Strait off Queensland and in Western Australia at Kure Bay.

Local oysters are suspended from the Port Moresby raft in baskets. Every 6 months their growth will be checked. After 12 months it may be possible to see whether the industry will be a paying proposition for the Territory. Production would take 2 or 3 years.

Australian-Japanese Fishing Venture Proposed for Papua-New Guinea: An Australian businessman from Brisbane hopes to set up a £250,000 (US\$556,000) fishing enterprise in Papua-New Guinea with the aid of Japanese labor and capital, according to a news service report.

If he gets approval from the Australian Government, the Brisbane businessman plans

to bring three 60-foot Japanese fishing trawlers to work in Papua's Gulf District. The vessels would be manned entirely by Japanese crews.

About 45 percent of the capital invested in the venture would be Japanese. The project includes plans to build wharves in Port Moresby and freezing and processing facilities for the catch, and later a cannery. (Pacific Islands Monthly, March and April 1965.)



## Poland

## TUNA CANNING EXPERIMENTS:

In connection with plans to begin fishing for tuna, a Polish plant at Gdynia has carried out tuna-canning experiments with imported fish. Good results were reported. (Polish Maritime News, April 1965.)

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FISHERIES EXPANSION  
PLANNED IN 1966-1970:

Poland's largest fishing cooperative, "Dalmor" of Gdynia, is scheduled to catch an overall total of 714,000 metric tons of fish over the period from 1966 to 1970. In 1970 Dalmor's annual catch is to total 174,000 tons, as against 117,000 tons to be landed in 1966. By the end of 1970 Dalmor is to own a fleet comprising 26 factory trawlers, 4 freezer trawlers, 4 tuna vessels, and about 30 steam trawlers.

The "Gryf" Deep-Sea Fishing Cooperative of Szczecin is scheduled to have 68 vessels and catch about 67,000 tons of fish in 1970. (Polish Maritime News, April 1965.)

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## NEW FISHING VESSEL DESIGNS:

The Polish Ships Design Office ("Bekate-mor") has worked out new designs for a 17-meter (56-foot) cutter to use ring nets, a 25-meter (82-foot) cutter to employ trawl and ring nets, and a 30-meter (98-foot) cutter to fish with trawls in African and South American waters. The office has also adapted the 27-meter (86-foot) stern cutter to use trawls. (Polish Maritime News, April 1965.)



## Portugal

### CANNED FISH INDUSTRY OUTLOOK FOR 1965:

Portuguese carryover stocks of canned sardines in oil at the beginning of 1965 were estimated at about 2 million cases of "1/4 club" cans. (The 1964 Portuguese canned fish pack in oil included a record sardine pack of 70,209 metric tons and 15,423 tons of other species, as compared with the 1963 pack of 49,644 tons and 20,776 tons, respectively.) Export shipments of canned sardines were moving well in early 1965 in spite of the rather large carryover.

Only moderate carryovers were reported for other Portuguese canned fish items in oil (chinchards, mackerel, tuna, and anchovy), so 1965 exports of those items will depend on the size of the pack this year.

In 1964 Portuguese canners raised prices for their pack of skinless and boneless sardines. This year the Portuguese Canned Fish Packers Association is reported to be considering plans to set up a minimum price system in order to eliminate the wide price fluctuations which have occurred in the past.

Portuguese exports of canned fish in oil in 1964 totaled 69,935 tons valued at conto 1,174,195 (US\$40.9 million) as compared with 71,076 tons in 1963 valued at conto 1,105,149 (\$38.5 million). The increase in value in the face of a small decline in shipments reflects the price increases of 1964. (Conservas de Peixe, April 1965.)



## South Africa Republic

### PELAGIC SHOAL FISH CATCH, FIRST QUARTER 1965:

South Africa's Cape west coast shoal fish catch for the first 3 months of 1965 was 146,646 short tons pilchards, 19,874 tons maasbanker, 24,287 tons mackerel, and 15,517 tons anchovy. The total catch was 207,324 tons. In the same period of 1964 the total catch was 205,247 tons, made up of 168,060 tons pilchards, 9,443 tons maasbanker, and 27,744 tons mackerel.

The January-March 1965 catch yielded 49,442 short tons of fish meal, 2,211,523 gallons of fish body oil, 2,098,824 pounds of can-

ned pilchards, 2,960,592 pounds of canned maasbanker, and 4,840,296 pounds of canned mackerel.

In the Territory of South-West Africa, all 7 of the pilchard-processing factories at Walvis Bay had started operations by the end of February 1965. The shoal catch landed at Walvis Bay in January-March 1965 totaled 130,666 tons and consisted of 130,422 tons pilchards and 244 tons anchovy.

South Africa's Cape west coast shoal fish catch for the first two months of 1965 was 51,602 short tons pilchards, 18,065 tons maasbanker, 12,275 tons mackerel, and 15,503 tons anchovy. The total catch was 97,445 tons. In the same period of 1964 the total catch was 130,640 tons, made up of 111,210 tons pilchards, 9,437 tons maasbanker, and 9,993 tons mackerel.

The January-February 1965 catch yielded 22,844 short tons of fish meal, 863,242 gallons of fish body oil, 1,643,976 pounds of canned pilchards, 2,635,392 pounds of canned maasbanker, and 1,971,384 pounds of canned mackerel.

In the Territory of South-West Africa, all seven of the pilchard processing factories at Walvis Bay had started operations by the end of February 1965. Their early catches were taken close inshore and yielded about 8 to 12 gallons of oil per ton of fish. (The South African Shipping News and Fishing Industry Review, March, April, May 1965.)

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### WORLD FISH MEAL MARKET TRENDS CAUSE CONCERN:

The uncertainties surrounding the world market for fish meal are causing some concern among producers in the South Africa Republic. The main concern is that world supplies will not satisfy world demand in 1965. Such a shortage would raise prices, but it could also lead to some disturbing long-term developments. The South African Shipping News and Fishing Industry Review, May 1965, published the following report on the situation:

For some years there have been attempts to find substitutes for the protein in fish meal, or to synthesize some of the more important amino acids. One of the projects has aimed to produce a protein as a byproduct of the

### South Africa Republic (Contd.):

petroleum industry. The project has produced preliminary samples which are neutral in taste and have a biological value equal to that of yeast. Fish meal is of course superior as a protein source. The petroleum project is still being developed and difficulties in the fish meal market would stimulate the experiments.

Another result of a shortage of fish meal might be in the use of smaller proportions in animal feeds. Already some feed manufacturers have cut the proportion to  $2\frac{1}{2}$  to 3 percent. Such a development could of course be seen as healthy progress towards the more efficient use of meal. But some producers may also see it--with the experiments in substitutes--as a warning that fish meal may be more difficult to sell in the future.

The growth of world trade in fish meal is one of the more remarkable events of recent years. In 1948 statistics compiled by the Food and Agriculture Organization showed total world fish meal exports of only 110,000 metric tons; 10 years later exports had risen to 657,000 tons. Then came the explosive growth of anchoveta fishing off Peru. By 1961 world exports had soared to 1,351,000 tons; in 1963 they totaled 1,769,000 tons; and in 1964 they were more than 2 million tons.

The sharp rise in available meal sent prices tumbling in the early 1960's. But the lower prices helped spread fish meal to more users and more importing countries. It proved a boon to the animal feed industry, took some of the pressure out of efforts to synthesize the protein (or some of the constituent amino acids) provided by fish meal, and eventually helped to place the market for fish meal on more solid foundations.

Now, stability in the fish meal market is again threatened--this time by a possible shortage rather than a surplus.

Under the circumstances, it would be timely to consider increasing production in South Africa to offset possible declines in output in South America.

A total catch of 1.2 million short tons of shoal fish in the South Africa Republic in 1964 yielded 284,000 short tons of meal. A decline in Cape production was more than balanced by an increase in the catch permitted in South-West Africa.

Under current fishing regulations, South African fish meal output in 1965 should be about the same or less than last year. However, if quotas were raised, more fish could be caught quite easily in South-West Africa, and perhaps also in South Africa if it was decided to extend the Cape season for anchovy.

What should also be considered is whether another 200,000 tons of pilchards added to the 1965 South-West Africa quota would endanger the resource, and whether this danger is sufficient to offset the benefit of the extra meal to the economy, to the industry, and to the future of the fish meal trade.

After calling for more fisheries research to clarify the South African fisheries potential, the South African Shipping News and Fishing Industry Review concluded with the statement: "Fisheries research is still so neglected that those who impose controls over the shoal catch continue to grope blindly never knowing the effect of fishing on the resource. In fact, conservation control is no more than the stop-go apprehensive stumble of a blind man learning to walk with a stick--a careful prod forward, a pause, and then another prod. It seems unfortunate that the pause period should fall in a critical year for the fish meal industry. We can only hope that it will be decided before the end of 1965 to try another prod forward."

\* \* \* \* \*

### RECORD FISHERIES CATCH IN 1964:

Record fisheries catch in the South Africa Republic (includes the Territory of South-West Africa) continued in 1964 when the total exceeded the 1,265,000 short tons of 1963 by more than 100,000 tons to reach a figure of 1,379,309 tons. That was the 7th year in succession that the catch has set a new record, and the 1964 total was nearly double the 724,000 tons of 1958 when the record-breaking run started.

In South-West Africa, the 1964 catch totaled a record 735,775 tons and included an estimated 2,000 tons of white fish, 2,000 tons of snoek, 8,000 tons of spiny lobster, 718 tons of anchovy, and 723,057 tons of pilchards.

In the rest of the South Africa Republic the catch was 643,534 tons of pilchards, masbanker, mackerel, anchovy, hake and other trawled fish, spiny lobster, snoek, line fish, and tuna. That total was just below the 651,000

## South Africa Republic (Contd.):

tons of 1963 and was well below the 725,000 tons of 1961.

In the Cape west coast shoal fishery, anchovy (at 104,630 tons) partly made up for the drop in the pilchard catch to 282,301 tons and brought the shoal fish catch to 471,578 tons. The trawl fish catch improved slightly over that of 1963 and reached 117,756 tons. The spiny lobster catch was estimated at 12,200 tons, line fish at 30,000 tons, snoek at 8,000 tons, and tuna at 4,000 tons. (The South African Shipping News and Fishing Industry Review, April 1965.)

\* \* \* \* \*

### ANCHOVY FISHING REGULATIONS ISSUED:

Following the successful anchovy fishery off the Cape west coast in 1964, that species was covered in new fisheries regulations published by the South Africa Republic in Government Gazette, February 26, 1965.

Regulations governing the pilchard fishery have been extended to anchovy so that both species are now subject to a closed season on the Cape west coast from August 1 to December 31. (The closed season for maasbanker and mackerel is from August 1 to October 31.)

Anchovy was also included with pilchards, maasbanker, and mackerel in regulations covering the licensing of canneries and fish meal plants to process those species. (The South African Shipping News and Fishing Industry Review, March 1965.)

\* \* \* \* \*

### NEW LICENSES EXPAND FISH-MEAL CAPACITY ON THE CAPE:

Press reports have indicated that the South African Government planned to grant 3 new fish meal licenses in 1965 thereby increasing the number of Cape fish meal factories from 14 to 17 and their total raw fish capacity from 270 to 320 short tons an hour.

In early March 1965, although official confirmation was lacking, South African newspapers announced that two companies, previously unknown in the fishing industry, had been allowed a concession to catch pelagic fish off the Namaqualand coast and to process

fish meal in a factory at Port Nolloth. Their license was said to be for 15 tons of raw fish an hour.

According to a report in the South African Financial Mail, a 10-ton license was to be granted to a company formed by a group of Cape fishermen and professional men, and a 25-ton license was to be divided equally between existing fish meal producers and a number of fisheries men operating along the west coast and around to Hermanus.

An increase in fish meal plant capacity on the Cape may be of little value unless it is matched by an increase in fishing capacity. The fleet of about 130 licensed shoal vessels was hard put to provide for 14 fish meal factories in 1964 during the 7 months pilchard season from January until the end of July. In the first 2 months of 1965 the Cape pilchard catch was less than 60,000 tons as compared with 111,210 tons in the same period of 1964. These trends indicate that 20 or 30 shoal vessels might be needed to support any expansion in productive capacity. (The South African Shipping News and Fishing Industry Review, April 1965.)



### U. S. S. R.

#### ANTARCTIC WHALE OIL AND SPERM OIL PRODUCTION, 1964/65 SEASON:

Total marine oil production from Soviet whaling in the Antarctic during the 1964/65 season was down about 13 percent from the previous season.

Soviet Antarctic Production of Whale Oil and Sperm Oil by Whaling Fleets During the 1964/65 Season <sup>1/</sup>			
Whaling Fleets	Whale Oil	Sperm Oil	Total Whale and Sperm Oil
	..... (Barrels <sup>2/</sup> ) .....		
Juri Dolgor . .	39,371	29,588	68,959
Slava . . . . .	21,765	50,651	72,416
Sov. Ukraina .	64,958	57,929	122,887
Sov. Rossia . .	47,376	22,029	69,405
Total all fleets	173,470	160,197	333,667
<sup>1/</sup> Preliminary.			
<sup>2/</sup> Six barrels equal one long ton.			
Source: <u>The Norwegian Whaling Gazette</u> , No. 4, 1965.			

Soviet whale oil output from the 1964/65 Antarctic catch totaled 173,470 barrels (about 28,900 long tons) as compared with production in 1963/64 of 214,438 barrels (35,700 tons).

## U.S.S.R. (Contd.):

Sperm oil output in 1964/65 was 160,197 barrels (26,700 tons), as compared with 167,715 barrels (27,950 tons) in the previous season. (United States Embassy, Copenhagen, May 18, 1965.)

Note: See Commercial Fisheries Review, Oct. 1964 p. 49.

\* \* \* \* \*

### SOVIETS DEVELOP SMALL "SUBMARINE HYDROPLANE" TO OBSERVE FISHING GEAR:

To make underwater observations of trawls and the reaction of fish to gear, the Soviet Institute of Fishery and Oceanological Research has built a "submarine hydroplane." The 1-man underwater craft is designed to be towed by a surface vessel. It has been tested successfully in the Mediterranean and the Atlantic off Africa where a Soviet engineer has made dives to a depth of 75 meters (246 feet). He reported that trawls showed up quite clearly at those depths and that no difficulty was experienced in obtaining film records at depths of 50 to 75 meters (164 to 246 feet), even without the use of light projectors installed on the craft.

The Soviet engineer who made the test dives says his colleagues have nicknamed him "Hydronaut No. 1." (World Fishing, April 1965.)



## United Kingdom

### UNITED STATES DEMAND FOR EUROPEAN FISH VERY BIG SAYS BRITISH EXECUTIVE:

Shortly after his return in May 1965 from America, where he had been buying and selling fish, the British managing director of a large fisheries firm in Hull discussed the United States market.

"There is a very big demand for European fish in America," he said. "The problem is more one of quality and suitability rather than of price. . . . They are looking more and more to the world picture for their supplies, rather than simply to their own domestic fishing which is not developed on the scale of various European countries."

He pointed to a large and expanding population as the big factor behind the U. S. demand.

Commenting on arrangements he had been making for contracts in North America, the British executive said that his exports would be frozen groundfish. So far as the imports were concerned, he said substantial contract arrangements would be entered into for frozen fish supplies from North America. These would include halibut, salmon, fillets, and shellfish from the East and West Coasts.

The British executive attended the North American Fisheries Conference while he was in the United States. (Fishing News, London, May 14, 1965.)

\* \* \* \* \*

### BOXING FISH AT SEA IMPROVES QUALITY:

Keeping time is increased by 1 to 3 days when fish are boxed at sea rather than stowed in bulk or shelved. That was the conclusion of the British White Fish Authority after small-scale tests in 1964 by the Torrey Research Station. Results equally as good were achieved during commercial tests with boxed fish aboard the trawler Summervale in the spring of 1965. After one trip during the test, the vessel returned with a catch of 44,800 pounds packed in specially designed boxes. (Fish Trade Gazette, April 24, 1965.)

Note: See Commercial Fisheries Review, November 1964 p. 114, and March 1964 p. 73.

\* \* \* \* \*

### NEW SEMIAUTOMATED STERN TRAWLER "ROSS FORTUNE" LAUNCHED:

The Ross Fortune was launched June 15, 1965, at a shipyard in Selby, England, for the British firm which pioneered semiautomated trawling in the North Sea with the Ross Darling. The Ross Fortune and her sistership Ross Fame will extend automation to middle-distance fishing. British middle-water vessels usually carry about 15 men, but Ross Fortune will start operations with a crew of only 10 men.

Ross Fortune is a shelter-deck stern trawler with an overall length of 139½ feet, a breadth moulded of 30 feet, and a depth moulded to upper deck of 19½ feet. Fish hold capacity is 8,500 cubic feet representing space for about 100 long tons of fish on shelves. Power is provided by an engine developing 950 b. hp. at 1,500 r.p.m.

When completed in the fall of 1965, Ross Fortune will operate out of Grimsby, England.

Note: See Commercial Fisheries Review, March 1965 p. 94.

\* \* \* \* \*



## United Kingdom (Contd.):

**NEW SEMIAUTOMATED STERN TRAWLER  
"ROSS DAINTY" ENTERS SERVICE:**

A major feature of the Ross Dainty, which entered service in late May 1965, is push-button control from the bridge of every fishing operation. It also provides automatic bridge control of the main engine, propeller pitch, pumps, and gearbox clutch. The vessel is the first of two additional "Daring" class semi-automated stern trawlers ordered by a large British trawling firm.



Fig. 1 - Ross Dainty, the most recent British semiautomated stern trawler.

Ross Daring and her sistership Ross Delight (both launched in 1963) pioneered semi-automated stern trawling in the North Sea. Each of those vessels has a length between perpendiculars of 85 feet, a range of about 30 days, and a fishhold capacity for about 140,000 pounds of iced fish. Each is worked by a crew of five men.



Fig. 2 - Ross Daring pioneered semiautomated stern trawling.

The Ross Dainty incorporates the basic design of the Ross Daring with improvements

developed through extensive trials of the earlier vessels. Changes in the Ross Dainty include an all-welded construction and fabricated stern frame; a length between perpendiculars of 86 feet 3 inches; and a slightly larger fishroom (5,000 cubic feet) covered with galvanized steel instead of aluminum.

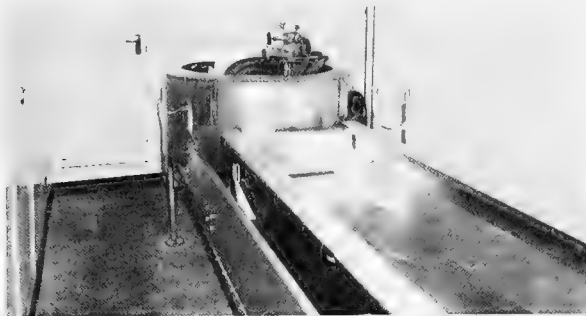


Fig. 3 - The gutting and washing room on the Ross Daring. After fish are sorted on deck, they are passed through a hatch for gutting in the stainless steel trough in the foreground. Fish are then washed and transferred by chute to the fishroom below.

The Ross Dainty is powered by a 4-stroke diesel engine developing 407 s. hp. at 1,200 r.p.m.

Note: See Commercial Fisheries Review, March 1965 p. 94, and Sept. 1963 p. 93.



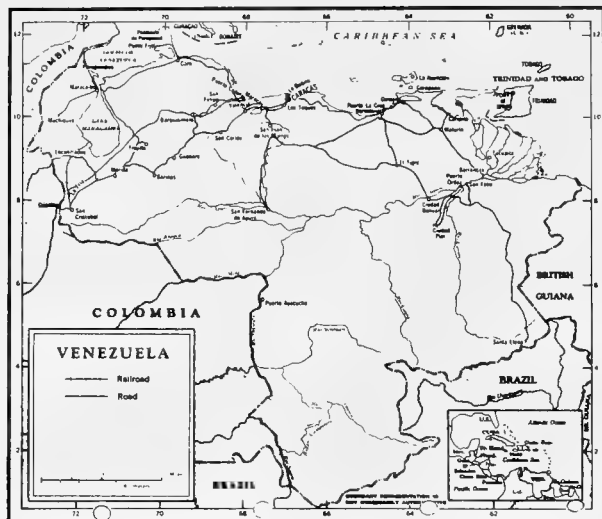
## Venezuela

### FISHERIES INVESTMENT OPPORTUNITY:

A Venezuelan firm is seeking a joint venture to establish a smoked fish operation using Venezuelan species of tropical fish to produce a smoked herring-type product. According to the firm, laboratory tests combined with the experience of three small plants have shown that two species of fish termed "Cabana" and "Cataco," when smoked with local wood, have the taste and appearance of smoked herring. Those fish are captured in the nets of Venezuelan sardine purse seiners within 2 miles of shore. Fishermen are currently discarding the "Cabana" and "Cataco."

The project calls for a smoking plant with an initial capacity of 2 metric tons of raw fish a day. Calculating a 50 percent loss in weight, the weekly output would be about 5 to 7 tons. About 50 percent of the initial production would have to be sold in foreign markets. The smoking plant could probably be financed locally, and it would be located near the source

## Venezuela (Contd.):



of supply at one of three fishing centers in Venezuela.

A U. S. collaborator would be asked to supply fishing know-how and to bring into the company, for operation under the Venezuelan flag, an appropriate fully equipped fishing vessel. While the fish presently can be bought for a penny each from local fishermen, the company believes that when it begins production it should have its own boat in operation to insure an adequate supply of the required fish at competitive prices.

Note: Interested U. S. investors should write: Christian Pfeiffer, Americana Valor S.A., Edificio Galipan, A-2-F, Avenida Francisco de Miranda, Caracas (Apartado 11491 Chacao), Venezuela. A World Trade Directory report on the firm, dated March 31, 1965, may be obtained by qualified United States firms from U. S. Department of Commerce field offices for \$1.00 a copy.



## Republic of Viet-Nam

### FROZEN SHRIMP EXPORTS, 1964:

South Viet-Nam's exports of frozen shrimp during January-March 1965 were up from the same period a year earlier. In 1964 South Viet-Nam exported less frozen shrimp than in the previous year--732,000 pounds as compared with more than 1 million pounds in 1963.

In 1964 the United States received 77,000 pounds of that country's frozen shrimp exports. In the first quarter of 1965 the United States imported 26,000 pounds of frozen shrimp from South Viet-Nam, the same quantity as in the first quarter of 1964.

With the completion of additional fish landing facilities in that country, fishery products exports (including shrimp) are expected to increase. Trial shipments of frozen shrimp for market testing were made in 1964 to the United States, Europe, and Asiatic countries. (United States Embassy, Saigon, May 20, 1965.)

Note: See Commercial Fisheries Review, January 1965 p. 96.



## Yugoslavia

### NEW LAW PROCLAIMS EXTENDED TERRITORIAL WATERS AND CONTROL OVER ADJACENT CONTINENTAL SHELF RESOURCES:

A decree proclaiming a "Law on the Coastal Sea, The Outer Sea Belt, and the Epicontinental Belt of Yugoslavia" was published in the Yugoslav Official Gazette of SFRY, May 12, 1965, and became effective on May 20, 1965. The new law proclaims Yugoslav sovereignty over the "coastal sea of Yugoslavia" which includes "inner sea waters" and "the territorial sea." Base lines are set forth to be used in measuring those areas. The "inner sea" is within the base lines and the "territorial sea" is a belt of 10 nautical miles measured from the base lines toward the open sea.

The base lines specified are: (1) the low-tide lines along the coastline of the mainland and coastal islands; (2) straight lines closing the entrances to bays; and (3) straight lines connecting certain points on the mainland and coastal islands.

The law provides that a foreign fishing vessel while passing through the Yugoslav "territorial sea" must "keep her fishing equipment in the holds or sealed. Such a vessel must pass through the territorial sea by the shortest route, sailing at a speed not lower than the economic speed, without stopping or anchoring, unless this is necessary due to an act of God. During her passage through the territorial sea a foreign fishing vessel must bear clearly visible markings indicating a fishing vessel." The penalty provided for violation of those provisions is a fine of 20,000 to 200,000 dinars (US\$27 to \$267). Those provisions do not apply to a fishing vessel which has been granted permission, issued on the basis of an international agreement, for fishing in the "territorial sea," when such vessels are in the zone where they are allowed to fish.

## Yugoslavia (Contd.):

Foreign fishing vessels are generally forbidden to enter Yugoslavia's "inner sea waters" unless forced there by an act of God. The penalty for such a violation is a fine of 50,000 to 500,000 dinars (\$67 to \$667) and is applicable to the captain of the vessel or any other responsible person aboard.

The new law prescribes an "outer sea belt" of 2 nautical miles measured from the outer boundary of the "territorial sea." In the "outer sea belt" competent Yugoslav authority is to "exercise control to prevent violation of customs, fiscal, and sanitary regulations. . . and to punish breaches of these regulations."

The "epicontinental belt" is described as "the sea bottom and the underground of the submarine space outside the outer boundary of the territorial sea to a depth of 200 meters (656 feet), and also beyond that boundary to the line where the depth of the water over the sea bottom permits exploitation of the natural wealth of the sea bottom and its underground."

Yugoslavia claims sovereign rights over the "epicontinental belt" concerning the exploration and exploitation of its natural wealth--including its underground and living organisms which, in the stage in which they are caught, are immovable on the sea bottom or underneath the sea bottom, or can move only when in continual, physical contact with the sea bottom or its underground.



#### AUSTRALIAN SHRIMP TRAWLER NETS RARE "BARKING" SPINY LOBSTER

A total of 22 unusual spiny lobster caught by the shrimp trawler Century Star, the latter part of 1964 in 65 fathoms of water 25 miles off Mooloolaba, Queensland, have been identified as "barking crayfish" (Linuparus trigonus). Previously they were recorded only twice in Australia.

The first example of the species (which belongs to the Japanese seas) recognized in Australia was taken in the net of a steam trawler in 65 fathoms off Botany Bay, New South Wales in 1949. Another specimen was netted in 50 fathoms of water, 16 to 18 miles off Newcastle, in 1956. Up until 1949 the only other record of the species being found outside Japanese waters was when a single specimen was trawled off Portuguese East Africa, in 180 fathoms of water.

The common name of "barking crayfish" was given to Linuparus trigonus by F. A. O'Neill in the June 1956 issue of the Australian Museum Magazine when he examined a live specimen caught off Newcastle.

When the spiny lobster flexed its tail and threw its pair of heavy antennae backwards over its head, the movement was accompanied by a loud harsh grating sound or "bark."

The source of the noise was later found to be the inner angles of the heavy basal joints of the stubby antennae, just in front of the eyes. Here there were two smooth-lined cavities which enclosed and bore upon a pair of highly-polished bosses when the antennae assembly was thrown backwards over the head. Even after death a semblance of this friction-produced sound could readily be produced by hand manipulation. (Australian Fisheries Newsletter, November 1964.)



# FEDERAL ACTIONS



## Department of the Interior

### FISH AND WILDLIFE SERVICE

#### HEARINGS ON APPLICATIONS FOR FISHING VESSEL CONSTRUCTION DIFFERENTIAL SUBSIDY:

Joseph & Lucia, Inc., Gloucester, Mass., has applied for a fishing vessel construction differential subsidy to aid in the construction of a 99-foot overall steel vessel to engage in the fishery for groundfish, lobster, and whiting. A hearing on the economic aspects of this application was held on July 20, 1965, in Washington, D. C. The U. S. Bureau of Commercial Fisheries published the notice of the application and hearing in the Federal Register, June 16, 1965.

Captain Ahab, Inc., New Bedford, Mass., has applied for a fishing vessel construction differential subsidy to aid in the construction of an 88-foot overall steel vessel to engage in the fishery for scallops, groundfish, lobster, and swordfish. A hearing on the economic aspects of this application was held on August 3, 1965, in Washington, D. C. Notice of the application and hearing appeared in the Federal Register, June 25, 1965.

Five applications for fishing vessel construction differential subsidies to aid in the construction of 144-foot overall steel vessels have been received from firms in San Diego, Calif. The firms are Gina Karen Fishing, Inc.; Hope Fishing, Inc.; Lou Jean II Fishing, Inc.; Marilyn M. Fishing, Inc.; and Vivian Ann Fishing, Inc. Each of those firms has separately applied for a subsidy to build its own vessel to engage in the fishery for tuna and tuna-like fish, for demersal fish such as flounder, hake, redfish, and pollock in the Pacific Ocean, for crab and shrimp in the Pacific Ocean, and for pelagic fish such as anchovies and jack mackerel. A hearing on the economic aspects of those applications was held on August 10, 1965, in Washington, D. C. Notice of the hearing

and applications was published in the Federal Register, July 3, 1965.

Note: See Commercial Fisheries Review, May 1965 p. 98; Apr. 1965 p. 92.

### BUREAU OF COMMERCIAL FISHERIES

#### INTERIM AMENDMENT TO U. S. STANDARDS FOR GRADES OF FROZEN RAW BREADED SHRIMP:

The U. S. Bureau of Commercial Fisheries has received a number of comments on the proposed amendments to Title 50, Code of Federal Regulations, Part 262--United States Standards for Grades of Frozen Raw Breaded Shrimp, published in the Federal Register, March 18, 1965. In view of the numerous comments it would not be in the public interest at this time to adopt the proposed amendments to Part 262.

Instead an interim amendment was adopted and became effective on publication in the Federal Register, June 5, 1965. The interim amendment is only a technical modification designed to bring Part 262 into conformity with the Definitions and Standards of Identity for Frozen Raw Breaded and Lightly Breaded Shrimp (published in the Federal Register, March 5, 1965, by the Food and Drug Administration).

The only effect of the interim amendment is to prescribe a method of determining shrimp content which allows a correction factor of 2 percent.

The interim amendment is only a temporary modification. After all comments concerning the proposed notice of rule making which was published on March 18 have been received and given full consideration, a new, comprehensive, and revised Part 262 will be adopted.

The interim amendment as published in the June 5, 1965, Federal Register follows:

## Title 50—WILDLIFE AND FISHERIES

### Chapter II—Bureau of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior

#### SUBCHAPTER G—PROCESSED FISHERY PRODUCTS, PROCESSED PRODUCTS THEREOF, AND PROCESSED FOOD PRODUCTS

### PART 262—UNITED STATES STANDARDS FOR GRADES OF FROZEN RAW BREADED SHRIMP

#### Definitions and Methods of Analysis

On March 5, 1965, the Food and Drug Administration published in the *FEDERAL REGISTER* (30 F.R. 2860) Definitions and Standards of Identity for Frozen Raw Breaded and Lightly Breaded Shrimp (21 CFR 36). Particular sections of these Definitions and Standards of Identity become effective 90 days after publication. On March 18, 1965, the Department of the Interior published in the *FEDERAL REGISTER* (30 F.R. 3598) a notice of proposed rule making to amend Part 262 of Title 50 of the Code of Federal Regulations. Interested persons were

given 30 days in which to submit comments upon the proposed amendments to Part 262. Due to the numerous comments submitted to the Department by interested persons, it would not be in the public interest at this time to adopt the proposed amendments to Part 262 as published.

Accordingly, notice is given that pursuant to the authority vested in the Secretary of the Interior by sections 203 and 205 of Title II of the Agricultural Marketing Act of 1946, as amended, it is proposed to adopt an interim amendment to Part 262 in order to bring Part 262 into conformity with the Definitions and Standards of Identity for Frozen Raw Breaded and Lightly Breaded Shrimp. This amendment to Part 262 is only a temporary and technical modification of Part 262. After all comments concerning the proposed notice of rule making, which was published on March 18, have been received and given full consideration, a new, comprehensive and revised Part 262 will be adopted.

Since the breaded shrimp industry must comply with certain mandatory requirements of the Definitions and Standards of Identity for Frozen Raw Breaded and Lightly Breaded Shrimp

beginning June 3, 1965, and since this amendment achieves technical conformity of Part 262 with the Definitions and Standards of Identity regarding the calculation of the percent of shrimp material, notice and public procedure thereon have been deemed unnecessary and impracticable.

#### § 262.21 Definitions and methods of analysis.

- (1) Percent shrimp material. . . .
- (2) . . . .
- (ii) Calculate percent shrimp material:

$$\frac{\text{Percent shrimp material} \times \text{weight of debreaded sample}}{\text{weight of sample}} \times 100 = 2$$

These regulations shall become effective upon publication in the *FEDERAL REGISTER*.

(Sec. 6, 70 Stat. 1122; 16 U.S.C. 742a; secs 203, 205, 60 Stat. 1087, 1090, as amended; 7 U.S.C. 1622, 1624)

JOHN A. CARVER, JR.,  
Under Secretary of the Interior.

JUNE 3, 1965.

Note: See *Commercial Fisheries Review*, June 1965 p. 82.

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## U. S. INSPECTION AND CERTIFICATION PROCEDURES FOR FISHERY PRODUCTS MODIFIED BY MINOR TECHNICAL AMENDMENTS:

Minor technical amendments to Title 50, Code of Federal Regulations, Part 260--In-

## Title 50—WILDLIFE AND FISHERIES

### Chapter II—Bureau of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior

#### SUBCHAPTER G—PROCESSED FISHERY PRODUCTS, PROCESSED PRODUCTS THEREOF, AND CERTAIN OTHER PROCESSED FOOD PRODUCTS

### PART 260—INSPECTION AND CERTIFICATION

### PART 266—UNITED STATES STANDARDS FOR GRADES OF FROZEN RAW BREADED FISH PORTIONS

#### Miscellaneous Amendments

Notice is hereby given that pursuant to the authority vested in the Secretary of the Interior by sections 203 and 205 of Title II of the Agricultural Marketing Act of 1946, as amended, and of the authority transferred to the Department of the Interior by section 6(a) of the Fish and Wildlife Act of 1956, as amended, it is proposed to adopt amendments to Part 260—Inspection and Certification, and Part 266—U.S. Standards for Grades of Frozen Raw Breaded Fish Portions as set forth below. The features of these amendments are to delete the words sirup, sirup density, and viner refuse, where they appear in Part 260; to add the letters "U.S." to an approved inspection

mark illustrated as Figure 5 in Part 260; and to substitute the words "uniformly shaped" for the word "rectangular-shaped" in Part 266.

Inasmuch as these amendments involve minor technical changes in Title 50, notice and public procedure thereon have been deemed unnecessary and the amendments shall become effective upon publication in the *FEDERAL REGISTER*.

In Part 260—Inspection and Certification:

1. In § 260.6, item (b) (1) of *Inspection service* is amended to read as follows:

§ 260.6 Terms defined.

*Inspection service.* . . . .

(b) . . . .

(1) Essential characteristics such as style, type, size, or identity of any processed product which differentiates between major groups of the same kind;

2. Section 260.23 is amended to read as follows:

§ 260.23 Postponing inspection service.

If the inspector determines that it is not possible to accurately ascertain the quality or condition of a processed product immediately after processing because the product has not reached equilibrium in color, or drained weight, or for any other substantial reason, he may postpone inspection service for such period as may be necessary.

speciation and Certification, and Part 266--U. S. Standards for Grades of Frozen Raw Breaded Fish Portions, became effective on publication in the *Federal Register*, June 2, 1965, as follows:

3. In § 260.86, paragraph (b), figure 5 is amended as set forth below:

§ 260.86 Approved identification.

(b) *Inspection marks.* . . . .



Statement enclosed within a shield.

FIGURE 5.

4. Section 260.98(b) is amended to read as follows:

§ 260.98 Premises.

(b) Litter, waste, and refuse (e.g. garbage, offal, and damaged containers) within the immediate vicinity of the plant, buildings, or structures;

5. Section 260.99(g) is amended to read as set forth below:

§ 260.99 Buildings and structures.

(g) Every practical precaution shall be taken to exclude dogs, cats, and vermin (including, but not being limited to, rodents and insects) from the rooms from which processed products are being prepared or handled and from any rooms from which ingredients (including, but not being limited to salt, sugar, spices, flour, and fishery products) are handled or stored. Screens, or other devices, adequate to prevent the passage of insects shall, where practical, be provided for all outside doors and openings. The use of poisonous cleaning agents, insecticides, bactericides, or rodent poisons shall not be permitted except under such precautions and restrictions as will prevent any possibility of their contamination of the processed product.

In Part 266—United States Standards For Grades of Frozen Raw Breaded Fish Portions:

Section 266.1 is amended to read as follows:

**§ 266.1 Description of the product.**

Frozen raw breaded portions are clean, wholesome, uniformly shaped, unglazed masses of cohering pieces (not ground) of fish flesh coated with breading. The portions are cut from frozen fish blocks; are coated with a suitable, wholesome batter and breading; and are packaged and frozen in accordance with good commercial practice. They are maintained at temperatures necessary for the preservation of the product. Frozen raw breaded fish portions weigh more than

1½ ounces, and are at least ¾-inch thick. Frozen raw breaded fish portions contain not less than 75 percent, by weight, of fish flesh. All portions in an individual package are prepared from the flesh of one species of fish.

These regulations shall become effective upon publication in the FEDERAL REGISTER.

(Sec. 6, 70 Stat. 1122; 16 U.S.C. 742e; secs. 203, 205, 60 Stat. 1087, 1090, as amended; 7 U.S.C. 1622, 1624)

JOHN A. CARVER, Jr.,  
Under Secretary  
of the Interior.

MAY 26, 1965.

\* \* \* \* \*

## AMENDED REGULATIONS UNDER THE COMMERCIAL FISHERIES RESEARCH AND DEVELOPMENT ACT:

Amendments to Title 50, Code of Federal Regulations, Part 253--Commercial Fisheries Research and Development--were published in the Federal Register, June 11, 1965, at which time they became effective. The amendments apply only to Sections 253.2(a) and 253.3(f) of the regulations.

The original regulations in 50 CFR Part 253 brought into effect the Commercial Fisheries Research and Development Act of 1964 (P. L. 88-309). That Act provided, among other things, for the payment under Section 4(a) of \$5 million annually to States for commercial fishery research and development over a 5-year period. Congress adjourned in 1964 before it was able to appropriate funds to implement that portion of the Act.

States are required to provide matching funds equal to at least 25 percent of the cost of a project financed under Section 4(a) of P. L.

88-309. Generally the matching funds provided by States must be additional funds allocated for the particular project and not funds diverted from some other commercial fishery project. But a limited exception to that requirement was provided in Section 253.2(a) of the regulations, for the benefit of those States in which the legislature did not meet after the Act was approved. In such case, the taking of State matching funds from appropriations for other fishery projects could be considered in fiscal years 1965 and 1966. The purpose of the amendment to Section 253.2(a) is to extend that exception for a limited time after Federal funds are appropriated to implement the Act.

The amendment to Section 253.3(f) of the regulations provides an exception to State contracting procedures in respect to contracts for research and development and professional services.

Following are the amendments as published in the Federal Register, June 11, 1965:

## Title 50—WILDLIFE AND FISHERIES

### Chapter II—Bureau of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior

#### SUBCHAPTER F—AID TO FISHERIES

### PART 253—COMMERCIAL FISHERIES RESEARCH AND DEVELOPMENT

#### Interpretation of the Authorization; Use of Research and Development Funds

On page 5382 of the FEDERAL REGISTER of April 15, 1965, there was published a notice and text of proposed amendments to §§ 253.2(a) and 253.3(f) of Part 253 of Title 50, Code of Federal Regulations. The purpose in amending § 253.2(a) was to extend the time during which a State can utilize funds which have previously

been provided for other commercial fishery projects. The purpose of amending § 253.3(f) was to provide an exception to State contracting procedures in respect to contracts for research and development and professional services.

Interested persons were given 30 days in which to submit written comments, suggestions, or objections with respect to the proposed amendments.

One comment was received pertaining to the amendment of § 253.2(a). Consideration has been given to this comment and appropriate clarifying changes have been made in this section. These changes will permit a State to utilize funds during fiscal years 1965 and 1966 which have previously been provided for other commercial fisheries research and development because a State legislature did not meet for a significant and practicable period of time after appropriation of funds for section 4(a) of the Act. No comments were received on the proposed amendment to § 253.3(f).

#### § 253.2 Interpretation of the authorization.

(a) Supplement, and, to the extent practicable, increase the amounts of State funds. The words "supplement, and, to the extent practicable, increase the amounts of State funds" mean that State funds, to be used for at least 25 percent of the cost of a project financed with research and development funds, will be additional funds provided for that project and will not represent funds diverted from some other commercial fishery project; except, that during fiscal years 1965 and 1966, the fact that a State legislature did not meet for a significant and practicable period of time after appropriation of funds for section 4(a) of the Act will be considered evidence that it is not feasible for the State Agency to furnish funds that have not been previ-



ously used for other commercial fishery projects.

§ 253.3 Use of research and development funds.

(f) *Contracts.* Supply, service, equipment, and construction contracts, other than research and development contracts and contracts for professional services, involving an expenditure of \$2,500 or more entered into by a State Agency for the execution of approved project activities shall be based upon free and open competitive bids. If a contract is awarded to other than the lowest responsible bidder, the payment of the Federal portion of the cost of the project shall be based on the lowest responsible bid, unless it is satisfactorily shown that it was advantageous to the project to accept a higher bid. Upon request, the State Agency shall certify and promptly furnish to the Secretary a copy of each contract executed and copies of all bids received concerning the contract. Contracts for research and development, and professional services may be negotiated, provided that the Secretary is satisfied that adequate steps are taken to insure economical and efficient services and the impartial selection of contractors.

This amendment shall become effective on the date of publication in the FEDERAL REGISTER.

JOHN A. CARVER, JR.,  
*Acting Secretary of the Interior.*

JUNE 8, 1965.

Note: See Commercial Fisheries Review, June 1965 p. 83.

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### VESEL DEFINITION AMENDMENT UNDER FISHING VESSEL MORTGAGE INSURANCE PROCEDURES:

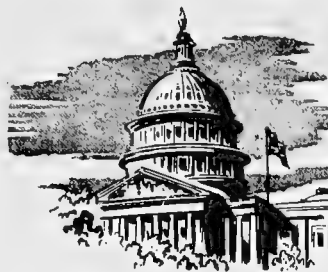
An amendment to Title 50, Code of Federal Regulations, Part 255 (Fishing Vessel Mortgage Insurance Procedures), was published in the Federal Register, July 1, 1965. The amendment revises paragraph (a) of Sec. 255.2 to read:

(a) Fishing vessel. The term "fishing vessel" includes any vessel documented or to be documented as a fishing vessel of the United States which is designed to be used in catching fish, processing or transporting fish loaded on the high seas, or any vessel outfitted for such activity.

The purpose of the revision is to change the definition of fishing vessel in the mortgage insurance regulations to conform with the definition provided for in the United States Fishing Fleet Improvement Act.

Note: See Commercial Fisheries Review, July 1965 p. 101.

## Eighty-Ninth Congress (First Session)



Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House

and Senate, as well as signature into law or other final disposition are covered.

**ANTIDUMPING ACT AMENDMENT:** Introduced in House, H. R. 9195 (Fogarty) June 17, 1965, H. R. 9331 (Duncan of Tenn.) June 22, and H. R. 9485 (Rhodes of Pa.) June 28, to amend the Antidumping Act, 1921; to Committee on Ways and Means.

Rep. Thompson of Texas in Congressional Record, June 23, 1965 (pp. 14003-14004), pointed out that passage of the proposed 1965 amendment to the Antidumping Act of 1921--S. 2045, H. R. 8510, and related bills--would enable our country to lead the way in the difficult and delicate task of formulating effective curbs on dumping. These could later be proposed to other nations in due course as a practical model. Same day Sen. Scott inserted (p. 14042) an article from the Chicago Tribune, June 14, 1965, "Antidumping Bill Gets Solid Support," by Eliot Janeway, consulting economist, Chicago Tribune press service.

**AQUATIC PLANT CONTROL:** H. R. 8990 (Morton) introduced in House, June 10, 1965, to provide for the control and progressive eradication of certain aquatic plants in the States of Maryland, Virginia, New Jersey, and Tennessee; to Committee on Public Works.

**CALIFORNIA COMMERCIAL FISHING INDUSTRY:** Senate received a joint resolution of the Legislature of the State of California (S. J. Res. 46), pointing out the importance of the California fishing industry, and urging the enactment of legislation in the Congress of the United States designed to assist the American Commercial fishing industry through fisheries loans and through expanded marine research.

**FISH AND WILDLIFE COORDINATION ACT:** H. R. 9492 (Dingell) introduced in House June 28, 1965, to amend the Fish and Wildlife Coordination Act to provide adequate notice and opportunity for the Secretary of the Interior and State fish and wildlife agencies to conduct studies on the effects of projects licensed by Federal agencies on fish and wildlife resources, and for other purposes; to Committee on Merchant Marine and Fisheries.

**FISHERIES LOAN FUND EXTENSION:** Committee on Commerce reported (S. Rept. 325) favorably to Senate June 14, 1965, S. 998.

S. Rept. 325, Fisheries Loan Act (June 14, 1965, report from the Committee on Commerce, U. S. Senate, 89th Congress, 1st session, to accompany S. 998), 10

pp., printed. Discusses purpose of the bill, status of fishery loan fund, costs, and presents agency reports.

Senate June 16, 1965, passed with committee amendment S. 998, with title amended: "to amend section 4 of the Fish and Wildlife Act of 1956 to authorize the Secretary of the Interior to make loans for the financing and refinancing of new and used fishing vessels, and to extend the term during which the Secretary can make fisheries loans under the Act." Sen. Mansfield inserted in that day's Congressional Record (pp. 13372-13373) an excerpt from the report (S. Rept. No. 325). Purpose of the bill, as amended, is to extend for an additional 5 years the fishery loan program administered by the Bureau of Commercial Fisheries. The loan program was initiated under section 4 of the Fish and Wildlife Act of 1956 and expires June 30, 1965. Would modestly expand the scope of the present program to permit a loan to be made regardless of whether the vessel to be acquired will replace an existing vessel. Would also remove the present minimum annual interest rate of 3 percent and substitute a formula for establishing the interest rate. The formula provides for the annual payment to the Treasury from the loan fund of interest on the cumulative amount of appropriations available as capital to the fund taking into consideration the average cost of all outstanding interest-bearing Treasury obligations of comparable maturity. At the present time, this would result in a 4-percent interest rate. Although a minimum of 3 percent is permitted under the present law, the practice generally has been to charge 5 percent and it is anticipated that this practice would continue under the proposed amendment. The committee amendments added certain specific conditions to the making of loans. The conditions, which are similar to those now in Department regulations, relate to the requirement of adequate security, requirements regarding the applicant's ability and experience to operate a fishing vessel, and the applicant's citizenship. In addition, the Secretary is required to determine that a loan on a vessel, which will not replace an existing vessel, will cause no economic hardship to efficient vessel operators already operating in that fishery. The final amendment provides that the money now available in the fund will remain available for use from and after July 1, 1965.

House June 17, 1965, received Senate-passed S. 998; to Committee on Merchant Marine and Fisheries. House Committee June 30, 1965, ordered favorably reported to the House S. 998 (in lieu of H. R. 4227). July 7, 1965, Committee reported (H. Rept. 600) to House S. 998, to amend section 4 of the Fish and Wildlife Act of 1956 to authorize the Secretary of the Interior to make loans for the financing and refinancing of new and used fishing vessels, and to extend the term during which the Secretary can make fisheries loans under the act, without amendment; to Committee of the Whole House on the State of the Union.

**FISHERMEN'S COOPERATIVE ASSOCIATIONS**  
BANK: H. R. 8922 (Hagen of Calif.) introduced in House June 9, 1965, to provide credit facilities for use of fishermen's cooperative association through establishment of a bank for Fishermen's Cooperative Associations, and for other purposes; to Committee on Merchant Marine and Fisheries. Would authorize and direct the Secretary of the Interior to charter a "Bank for Fishermen's Cooperative Associations," with principal offices in Washington, D. C. The bank would have 7 directors appointed by the Secretary, with the Director of the Bureau of Commercial Fisheries serving as Chairman of the Board of Directors. Would authorize

an appropriation of \$10 million as a revolving fund to be used in making loans to fishermen's cooperative associations for the following purposes: "(1) To finance fish and shellfish or products thereof stored in cold storage or other storage facilities owned, leased, or used by such fishermen's cooperative associations . . . (2) To provide operating capital required to supplement the capital funds of fishermen's cooperative associations; (3) To finance or refinance the acquisition of land, buildings, and equipment used by fishermen's cooperative associations in connection with activities related to the processing, preparing for market, handling, or marketing of fish and shellfish; the purchasing, testing, grading, processing, distributing, or furnishing of fishing gear, fuel, ice, and other supplies . . . and the furnishing of business services to such activities; (4) To finance and refinance the operations, maintenance, replacement, repair, and equipment of fishing gear and vessels . . ." In addition, bill contains a "Declaration of Policy," which states that fishermen's cooperative associations, as defined in the Act of June 25, 1934, "materially contribute toward the promotion of effective merchandising of fish and shellfish in interstate and foreign commerce," and further states that provisions of the bill which provide credit facilities to these associations are necessary "in order to promote the effective merchandising of fish and shellfish by aiding in preventing excessive fluctuations or depressions in prices and thus disrupting domestic markets and by maintaining the economic health of fishermen's cooperative associations."

**FISHERMEN'S ORGANIZATION AND COLLECTIVE BARGAINING:** Subcommittee on Fisheries and Wildlife Conservation of House Committee on Merchant Marine and Fisheries met June 17, 1965, on H. R. 3955, to make clear that fishermen's organizations have a voice in the ex-vessel sale of fish or other aquatic products on which the livelihood of their members depends. Same day and June 21, Subcommittee held a hearing on the bill.

**FISHING LIMIT OF 12 MILES:** S. 2218 (Bartlett and 2 others), S. 2225 (Magnuson) introduced in Senate and H. R. 9531 (Downing), H. R. 9540 (Meeds) introduced in House, June 29, 1965, to establish a contiguous fishery zone beyond the territorial sea of the United States; to Committee on Commerce and Committee on Merchant Marine and Fisheries, respectively. Sen. Bartlett in Congressional Record, June 29, 1965 (pp. 14506-14509), pointed out that the purpose of this bill is to create a 9-mile zone beyond the present 3-mile territorial sea for the conservation and protection of our coastal fishery resources. The fishery resources within this zone will be reserved for the exclusive use of American fishermen with one exception. That exception provides for the continuation of traditional fishing by foreign states within this new zone as may be recognized by the United States. He stated, "I am advised that only Canada has any historic fishery within this zone off the coast of the United States and that Canada has informally recognized reciprocal historic fisheries by the U. S. fishermen off Canada." He inserted a table--"Claims of nations to breadth of territorial sea (including zones for specialized purposes)"--prepared by the Secretary General of the United Nations on Feb. 8, 1960 (U. N. document A/Conf., 19/4) for the Second Geneva Conference on the Law of the Sea. He also inserted a tabulation showing numerous changes since the tabulation of the table. Sen. Magnuson and Rep. Meeds (p. 14623) also spoke on this proposal.

**FISHING VESSEL REPLACEMENT RESERVE FUND:** Subcommittee on Merchant Marine and Fisheries June 24, 1965, held hearings on S. 1858, to promote the replacement and expansion of nonsubsidized merchant and

fishing fleets, with testimony. Hearings recessed until July 7.

**FOOD IRRADIATION PROGRAM:** Joint Committee on Atomic Energy held hearings June 9-10, 1965, on the subject of preservation of food through the use of ionizing radiation. Committee took a close look at the commercial prospects of irradiated foods. The Food and Drug Administration has only cleared wheat, potatoes, and bacon. Commercial witnesses maintain that until increased clearances are made, they cannot accurately plot the acceptability without market testing. Another use of irradiation discussed was that of the control or irradiation of salmonella. This could reduce the necessity of required steam autoclaving by foreign governments of fish meal and bone meal. It was stated that this process reduces available lysine by 25 percent. Most public witnesses indicated that at this time and during this generation, labeling of irradiated foods would probably kill the entire process. Principally the reason is the attitude this generation has toward radiation, fallout, etc.

**FOREIGN AID AND FISHERIES JURISDICTION:** Senate June 14, 1965, passed H. R. 7750, providing for a foreign aid program for fiscal years 1966 and 1967, which has been amended by substituting the text, as amended, of S. 1837, as amended. Prior to this action, there were additional amendments to S. 1837. Senate by 59 yeas and 24 nays adopted an amendment by Sen. Kuchel, that provides: "No assistance shall be furnished under this Act to any country which (1) has extended or hereafter extends, its jurisdiction for fishing purposes over any area of the high seas beyond that recognized by the United States, and (2) hereafter imposes any penalty or sanction against any United States fishing vessel on account of its fishing activities in such area. The provisions of this subsection shall not be applicable in any case in which the extension of jurisdiction is made pursuant to international agreement to which the United States is a party. Sen. Kuchel spoke of the recent incidents in which U. S. vessels have been seized, fined, and fired upon by the Peruvian Government, to whom we provide aid. He stated that this amendment is necessary in order to demonstrate to any nation that the U. S. Government will not tolerate this treatment of any American citizen when he is utilizing in a legal fashion the high seas or the open seas. He inserted in Congressional Record, June 14, 1965 (p. 13014) the comments he made two years ago ("Freedom of the Seas: An Honorable Tradition that Must Be Preserved"); included is a table detailing the number and type of seizures, detentions, and other harassments of U. S. tuna vessels which occurred between Sept. 1951 and June 1963. This amendment was also discussed by Senators Magnuson, Gruening, Kennedy (Mass.), and other Senators; as well as Rep. Van Deerlin in the House. Senate insisted on its amendment, asked for conference with House, and appointed conferees. H. R. 7750 was introduced (Morgan) Apr. 29, 1965, to amend further the Foreign Assistance Act of 1961, as amended; to Committee of Foreign Affairs. Reported (H. Rept. 321) from Committee of Foreign Affairs May 7; passed House May 25, 1965. Senate placed on calendar May 26. Companion bill S. 1837 was reported (S. Rept. 170) from Committee on Foreign Affairs Apr. 28.

House June 17, 1965, disagreed to Senate amendments to H. R. 7750, agreed to the conference requested by Senate, and appointed conferees.

Conferees June 18, 1965, began to resolve the differences between the Senate- and House-passed versions of H. R. 7750, but did not reach final agreement.

**FUR SEAL CONSERVATION AND PRIBILOF ISLANDS ADMINISTRATION:** S. 2102 (Bartlett) introduced in Senate June 8, 1965, to protect and conserve the North Pacific fur seals, and to administer the Pribilof Islands for the conservation of fur seals and other wildlife, and for other purposes; to Committee on Commerce. Besides inserting a line-by-line analysis of the bill, Sen. Bartlett in Congressional Record, June 8, 1965 (pp. 12338-12339) commented that the bill has two principal titles. Title I gives legal expression to the terms of the Fur Seal Convention ratified by the Congress on Thursday, Jan. 30, 1964. The North Pacific Fur Seal Convention has been in effect since 1911. It is an agreement with Canada, Japan, Russia, and the United States participating which governs the conservation and utilization of the fur seal resources of the North Pacific. Title II, which deals with the administration of the islands, is designed to bring to the people of the Pribilof Islands the full benefits, rights, duties, and responsibilities which are theirs as citizens of Alaska and citizens of the United States. Would provide the Secretary of the Interior the authority he needs to see that the following reforms are carried out: inclusion of services performed before 1950 in the computation of civil service retirement benefits; transfer of title to lands, houses, and property from the Government to the citizens (fair compensation is provided for); abolishment of the pass now required to visit the islands; and development and strengthening of incorporated local government. Also H. R. 9602 (Rivers of Alaska) introduced in House July 1, to Committee on Merchant Marine and Fisheries.

**GRAND ISLE AND VICINITY, LOUISIANA:** H. Doc. 184, Letter from the Secretary of the Army, transmitting a letter from the Chief of Engineers, Department of the Army, Dated May 8, 1964, Submitting a Report, Together with Accompanying Papers and Illustrations, on an Interim Hurricane Survey of Grand Isle and Vicinity, Louisiana, Authorized by Public Law 71, 84th Congress, Approved June 15, 1955; referred to Committee on Public Works, House of Representatives, 89th Congress, 1st session, May 24, 1965, 162 pp., illus., printed. Contains favorable report from the Chief of Engineers, on an Interim Hurricane Survey of Grand Isle and Vicinity, Louisiana. Besides the report of the district engineer, it contains comments from various Federal agencies, State of Louisiana, and reports from the Chief of Engineers and Board of Engineers for Rivers and Harbors. One section of the report deals with economic development of fisheries and fur animals in the area, and contains a letter from Acting Regional Director of Bureau of Sport Fisheries and Wildlife, Atlanta, Ga.

**HALIBUT COMMISSION:** Senate Committee on Commerce, June 22, 1965, ordered favorably reported S. 1975, to authorize certain facilities for the International Pacific Halibut Commission. Committee June 30 reported (S. Rept. 383) with amendment S. 1975. Senate July 7 passed and cleared for the House S. 1975.

**HEALTH, EDUCATION AND WELFARE APPROPRIATIONS, FY 1966:** Subcommittee on Senate Committee on Appropriations concluded its hearings June 23, 1965, on H. R. 7765, fiscal 1966 appropriations for the Departments of Labor and Health, Education, and Welfare, and related agencies, after receiving testimony. H. R. 7765 was introduced April 29, 1965 (Fogarty).

**INLAND GREAT LAKES AND WESTERN RIVER RULE FOR SMALL VESSELS:** Subcommittee on Coast Guard, Coast and Geodetic Survey, and Navigation of House Committee on Merchant Marine and Fisheries

met June 22, 1965, on H. R. 956, to amend the inland, Great Lakes, and western rivers rules concerning sailing vessels and vessels under 65 feet in length. Similar to S. 1349.

**INTERIOR DEPARTMENT APPROPRIATIONS FY 1966:** House disagreed to Senate amendments to H. R. 6767, making appropriations for the Department of the Interior and related agencies for fiscal year 1966; agreed to a conference requested by the Senate; and appointed conferees.

Conferees June 14, 1965, agreed to file conference report (H. Rept. 513) on the differences between the Senate- and House-passed versions of H. R. 6767. The report was printed in Congressional Record, June 14, 1965 (p. 12913). Includes funds for the Fish and Wildlife Service and its two Bureaus: Commercial Fisheries, and Sport Fisheries and Wildlife. Both Houses June 15 adopted the conference report, thus clearing the bill for the President's signature. Conference report as adopted included the following referring to Bureau of Commercial Fisheries funds:

Amendment No. 26: Appropriates \$21,838,000 for management and investigation of resources instead of \$21,218,000 as per the House and \$22,268,000 as per the Senate. The increase provided over the House bill

includes: \$150,000 for a study of increasing mortality of Pacific Coast Oysters; \$270,000 for ocean engineering program, of which \$180,000 is for refinement and development of techniques for exploiting midwater species and \$90,000 is for the development of efficient harvesting devices for Alaska shrimp resources; and \$200,000 to initiate research to revitalize the Great Lakes fishing industry.

Amendment No. 27: Appropriates \$1,980,000 for construction instead of \$1,905,000 as per the House and \$2,080,000 as per the Senate. The increase provided over the House bill includes \$75,000 to complete construction and installation of fish screens in the Salmon River Drainage, Idaho. The reduction of \$100,000 made by the House for management technique studies and program supervision and engineering under the Columbia River program was sustained.

Amendment No. 28: Reported in technical disagreement, but House concurred in the Senate amendment providing that any unobligated balance as of June 30, 1965, of the amount appropriated for the construction of fishing vessels in the Supplemental Appropriation Act, 1965, shall be transferred to and merged with the 1966 appropriation under this head. Conferees agreed that this action shall not establish a precedent for future years.

Fish and Wildlife Service Appropriations for Fiscal Year 1966: Budget Estimate, the House Allowance, the Senate Allowance, and the Conference Allowance.

Item	Approp. FY 1965	Budget Est. 1966	House Allow.	Senate Allow.	Conf. Allow.
<b>FISH AND WILDLIFE SERVICE</b>					
<b>OFFICE OF THE COMMISSIONER OF FISH &amp; WILDLIFE</b>					
Salaries and expenses . . . . .	444,000	444,000	444,000	444,000	444,000
<b>BUREAU OF COMMERCIAL FISHERIES</b>					
Mgt. and invest. of resources . . . . .	19,107,900	21,218,000	21,218,000	22,268,000	21,838,000
Mgt. and invest. of resources (appropriation of receipts) . . . . .	(2,125,000)	-	-	-	-
Mgt. and invest. of resources (spec. for. currency program) . . . . .	300,000	300,000	300,000	300,000	$\frac{1}{3}$ 300,000
Construction . . . . .	5,913,000	1,405,000	1,905,000	2,080,000	$\frac{1}{1}$ 1,980,000
Construction of fishing vessels . . . . .	2,500,000	5,000,000	5,000,000	5,000,000	$\frac{2}{5}$ 5,000,000
Fed. aid for commercial fisheries research and development . . . . .	-	2,000,000	4,000,000	5,600,000	$\frac{3}{4}$ 4,800,000
Gen. administrative expenses . . . . .	704,000	674,000	674,000	674,000	674,000
Administration of Pribilof Islands (indefinite appropriation of receipts) . . . . .	(2,454,000)	(2,454,000)	(2,454,000)	(2,454,000)	(2,454,000)
Limitation on administrative expenses, fisheries loan fund . . . . .	(302,000)	(309,000)	(309,000)	(309,000)	(309,000)
<b>Total, Bureau of Commercial Fisheries . . . . .</b>	<b>28,524,900</b>	<b>30,597,000</b>	<b>33,097,000</b>	<b>35,922,000</b>	<b>34,592,000</b>
<b>BUREAU OF SPORT FISHERIES &amp; WILDLIFE</b>					
Mgt. and invest. of resources . . . . .	35,330,000	34,935,000	35,324,300	36,814,300	36,134,300
Construction . . . . .	9,257,800	2,992,000	5,115,500	7,943,700	7,077,200
Migratory bird conservation account . . . . .	8,000,000	7,500,000	7,500,000	7,500,000	7,500,000
Gen. administrative expenses . . . . .	1,443,000	1,458,000	1,458,000	1,458,000	1,458,000
Appalachian region fish and wildlife restoration projects . . . . .	1,350,000	-	-	-	-
<b>Total, Bureau of Sport Fisheries and Wildlife . . . . .</b>	<b>55,380,800</b>	<b>46,885,000</b>	<b>49,397,800</b>	<b>53,716,000</b>	<b>52,169,500</b>
<b>Total, Fish and Wildlife Service . . . . .</b>	<b>84,349,700</b>	<b>77,926,000</b>	<b>82,938,800</b>	<b>90,082,000</b>	<b>87,205,500</b>

1/To remain available until expended.

2/To remain available until expended; in addition, any unobligated balance as of June 30, 1965, of amount appropriated for this purpose in Supplemental Appropriation Act, 1965, shall be transferred to and merged with this appropriation.

3/Not to exceed \$300,000 shall be for program administration and \$400,000 for provisions of section 4(b) of the Act. Balance of \$4.1 million for apportionment to the states under section 5(a) of the Act shall be available until the close of the fiscal year following the year for which appropriated.

Amendment No. 29: Appropriates \$4,800,000 for Federal aid for commercial fisheries, research and development, instead of \$4,000,000 as per the House and \$5,600,000 as per the Senate.

Amendment No. 30: Allocates \$300,000 for administration of Federal aid for commercial fisheries research and development as per the Senate instead of \$150,000 as per the House.

Amendment No. 31: Allocates \$400,000 under section 4(b) of P. L. 88-309 as per the Senate instead of \$100,000 as per the House. And of that amount \$100,000 will be available to continue the special cooperative study to develop a virus-resistant oyster in the four Middle Atlantic States.

Amendment No. 32: Allocates \$4,100,000 under section 5(a) of P. L. 88-309 instead of \$3,750,000 as per the House and \$4,900,000 as per the Senate.

Total appropriations for the Bureau of Commercial Fisheries for fiscal year 1966 are \$34,592,000; for the Bureau of Sport Fisheries and Wildlife, \$52,169,500; Office of the Commissioner of Fish and Wildlife, \$444,000; total for Fish and Wildlife Service, \$87,205,500.

Bureau of Sport Fisheries and Wildlife Amendment No. 33: Conference appropriates \$36,134,300 for management and investigations of resources instead of \$35,324,300 as proposed by the House and \$36,814,300 as proposed by the Senate. The increase provided over the House bill includes: \$20,000 additional funds for cooperative fish units consisting of \$10,000 at the University of Georgia and \$10,000 at North Carolina State College; \$160,000 for the establishment of four cooperative fish units at \$40,000 each for Virginia Polytechnic Institute, University of Hawaii, Oregon State University, and Iowa State University; \$45,000 for expansion of sport fishing research in the North Central Reservoir area; \$40,000 for the establishment of a fishery management project in Vermont; \$195,000 consisting of \$150,000 for the increased operation of the fish behavior tank at the Atlantic Marine Game Fish Research Center, Sandy Hook, N. J.

Amendment No. 34: Appropriates \$7,077,200 for construction instead of \$5,115,500 as proposed by the House and \$7,943,700 as proposed by the Senate. The increase provided over the House bill includes: \$100,000 for planning of the marine game laboratory on the western Gulf of Mexico; \$50,000 for repair of existing docking facilities, Atlantic Marine Game Fish Research Center, N. J.; and funds for construction at National Fish Hatcheries.

H. Rept. 513, Department of the Interior and Related Agencies Appropriation Bill, 1966 (June 14, 1965, report from the Committee of Conference, U. S. House of Representatives, 89th Congress, 1st session, to accompany H. R. 6767), 13 pp., printed. Committee recommended that the Senate recede from certain amendments and that House recede from its disagreement to other amendments of the Senate. Some of the amendments concerned funds of the two Bureaus of the Fish and Wildlife Service: Commercial Fisheries, and Sport Fisheries and Wildlife.

House June 17, 1965, presented to the President H. R. 6767.

H. R. 6767 was signed by the President June 28, 1965 (P. L. 89-52).

METRIC SYSTEM STUDY: Rep. Roosevelt in Congressional Record, June 17, 1965 (p. A3171), stated that he was delighted to have from the Department of Commerce a favorable report on H. R. 1154 and others, which would provide for an investigation to determine the practicability of adopting the metric system of weights and measures for use in the United States.

MINIMUM WAGE: H. R. 9063 (Reid of N. Y.) introduced in House June 15, 1965, to amend the Fair Labor Standards Act to provide for the increase in the minimum wage; to Committee on Education and Labor.

Subcommittee of Senate Committee on Labor and Public Welfare began hearings July 6, 1965, on S. 986, to extend minimum wage coverage under the Fair Labor Standards Act, and other pending related bills (S. 763, 1741, 1770, 2210).

MORGAN CITY AND VICINITY, LOUISIANA: H. Doc. 167, Letter from the Secretary of the Army, transmitting a letter from the Chief of Engineers, Department of the Army, Dated May 28, 1964, Submitting a Report, Together with Accompanying Papers and Illustrations, on an Interim Hurricane Survey of Morgan City and Vicinity, Louisiana, Authorized by Public Law 71, 84th Congress, Approved June 15, 1955; referred to Committee on Public Works, House of Representatives, 89th Congress, 1st session, May 11, 1965, 140 pp., ill. s., printed. Contains favorable report from the Chief of Engineers, on an Interim Hurricane Survey of Morgan City and Vicinity, Louisiana. Besides the report of the district engineer, it contains comments from various Federal agencies, State of Louisiana, and reports from Chief of Engineers and Board of Engineers for Rivers and Harbors. One section of the report deals with economic development of fisheries and fur animals in the area, economic justification, and letter from Regional Director of Bureau of Commercial Fisheries, St. Petersburg Beach, Fla., and Director of the Louisiana Wildlife and Fisheries Commission, with letter of concurrence from Louisiana.

NEW BERN AND VICINITY, NORTH CAROLINA: H. Doc. 183, Letter from the Secretary of the Army, transmitting a letter from the Acting Chief of Engineers, Department of the Army, Dated Sept. 24, 1964, Submitting a Report, Together with Accompanying Papers and Illustrations, on an Interim Hurricane Survey of New Bern and Vicinity, North Carolina, Authorized by Public Law 71, 84th Congress, Approved June 15, 1955; referred to Committee on Public Works, House of Representatives, 89th Congress, 1st session, May 24, 1965, 131 pp., illus., printed. Contains favorable report from the Acting Army Chief of Engineers on a hurricane survey of New Bern and vicinity, North Carolina. Besides the report of the district engineer, it contains comments from various Federal agencies, State of North Carolina, and reports from Acting Chief of Engineers and Board of Engineers for Rivers and Harbors. One section of the report deals with economic development of the fisheries in the area.

NORTH PACIFIC FISHERIES TREATY: Rep. Pelly in Congressional Record, June 8, 1965 (p. 12394), spoke about the Japanese violation of the North Pacific Fisheries Treaty early in June 1965, when one boat was apprehended by the U. S. Coast Guard. He inserted a resolution adopted by the Association of Pacific Fisheries at a meeting in Seattle on June 7, urging the State Department to submit a strong protest to Japan against its catching salmon of North American origin.



Sen. Bartlett in Congressional Record, June 9, 1965 (p. 12559), spoke about the Japanese violation of the North Pacific Fisheries Treaty early in June 1965, and inserted in the record a telegram from the Executive Director, Alaska Sportsmen's Council, advocating a nationwide boycott of all Japanese manufactured sporting goods.

**OCEANOGRAPHIC AGENCY OR COUNCIL:** Rep. Wilson in extension of remarks inserted in Congressional Record, June 10, 1965 (pp. A3013-A3014) an article from Undersea Technology of May 1965: "Russian Fisheries Make Money and Serve Military."

**OCEANOGRAPHIC COMMISSION:** Introduced in House, H. R. 9064 (Rogers of Fla.) June 15, H. R. 9483 (Reinecke) June 28, H. R. 9617 (Hanna) July 2, H. R. 9687 (Downing) July 7, 1965, to establish a National Commission of Oceanography; to Committee on Merchant Marine and Fisheries. Rep. Rogers, in Congressional Record, June 15, 1965 (pp. 13239-13240), remarked that this legislation authorizes the President to appoint a Commission which will investigate the current status of U. S. efforts in the field of oceanography and recommend a future course of action with respect to our national needs and development programs. The Commission would be composed of five people from the field of industry; five from government; and five from the universities and laboratories participating in oceanographic work. "... The need for this Commission can be illustrated when we see that over \$44.7 million is being expended by the Federal Government in support of oceanographic research--yet this program is a splintered effort handled by the 18 departments and agencies . . . ." Rep. Hanna in Congressional Record, July 2, 1965 (p. 12986), pointed out that he had introduced a companion measure to H. R. 9064. The Commission would be authorized to conduct a "comprehensive investigation and study of all aspects of oceanography" and "recommend an overall plan for an adequate oceanographic program that will meet the present and future needs" of the United States. This investigation would include a review of the need for natural resources from the oceans and the current programs which are under way to meet those needs. The Commission would conclude by recommending an organizational plan and budget to accomplish the recommended goals, with final report to be filed 2 years after enactment of the bill.

**OCEANOGRAPHIC RESEARCH VESSEL INSPECTION:** Oceanographic Research Vessels Exemption: Hearings before the Subcommittee on Oceanography of the Committee on Merchant Marine and Fisheries, House of Representatives, 89th Congress, 1st session, on H. R. 3419 and H. R. 7320, bills to exempt oceanographic research vessels from the application of certain vessel inspection laws, and for other purposes, May 4, 5, 1965, Serial No. 89-8, 74 pp., printed. Includes texts of bills, departmental reports, and statements and communications of various Federal Officials, Representatives, research centers, universities, and associations.

Subcommittee on Oceanography of House Committee on Merchant Marine and Fisheries met in executive session June 10, 1965, and ordered reported favorably to the full committee S. 627 (amended) (in lieu of H. R. 3419, and identical bills), to exempt oceanographic research vessels from the application of certain vessel inspection laws. Full Committee ordered bill reported favorably June 30, and reported (H. Rept. 599) it with

amendments to House on July 7; referred to Committee of the Whole House on the State of the Union.

**OCEANOGRAPHY:** Sen. Pell in Congressional Record, June 17, 1965 (p. 13570), discusses the 4-day meeting held in Washington week of June 14 on the subject of ocean science and ocean engineering, with dual sponsorship by the Marine Technology Society and the American Society of Limnology and Oceanography. A great deal of the discussion centered on the role of the Federal Government in ocean development.

**ORDERLY MARKETING ACT 1965:** H. R. 8855 (Donohue) introduced in House June 8, 1965, to provide for the orderly marketing of articles imported into the United States, to establish a flexible basis for the adjustment by the U. S. economy to expanded trade, and to afford foreign supplying nations a fair share of the growth or change in the U. S. market; to Committee on Ways and Means.

**PESTICIDES AND FISH AND WILDLIFE:** Subcommittee on Fisheries and Wildlife Conservation of House Committee on Merchant Marine and Fisheries met June 22, on H. R. 4157 and S. 1623, to prevent or minimize injury to fish and wildlife from the use of insecticides, herbicides, fungicides, and pesticides. Same Committee met on H. R. 4158, to provide for advance consultation with the Fish and Wildlife Service and with State wildlife agencies before the beginning of any Federal program involving the use of pesticides or other chemical designed for mass biological controls. Hearings concluded same day.

**RUSSIAN FISHERIES OFF AMERICAN SHORE:** Rep. Wyatt (Congressional Record, June 30, 1965 pp. 14721-14722), addressed the House on "Russian Fishery on American Shore."

**SMALL BUSINESS DISASTER ASSISTANCE:** House June 21, 1965, passed S. 1796, to amend the Small Business Act to provide additional assistance for disaster victims, and cleared the bill for the President's signature. Senate June 23, 1965, presented to the President S. 1796. President signed it June 30, 1965 (P. L. 89-59).

**STATE DEPARTMENT APPROPRIATIONS FY 1966:** H. Rept. 427, Departments of State, Justice, and Commerce, the Judiciary, and Related Agencies Appropriation Bill, Fiscal Year 1966 (May 27, 1965, report from the Committee on Appropriations, U. S. House of Representatives, 89th Congress, 1st session, to accompany H. R. 8639), 41 pp., printed. Committee report in explanation of the accompanying bill making appropriations for the Departments of State, Justice, and Commerce, the Judiciary, and related agencies for the fiscal year 1966. Included under the State Department are funds for the various International Fisheries Commissions. Bill passed House June 1.

Subcommittee of Senate Committee on Appropriations, June 8, 1965, heard the Secretary and Deputy Under Secretary of State testify on H. R. 8639, State, Justice, and Commerce appropriations for fiscal year 1966. Hearing continued. Under State Department are included funds for International Fisheries Commissions. Subcommittee July 1, 1965, concluded its hearings on H. R. 8639.

Departments of State, Justice, and Commerce, the Judiciary, and Related Agencies Appropriations for 1966: Hearings before a subcommittee of the Commit-



tee on Appropriations, House of Representatives, 89th Congress, 1st session, subcommittee on Departments of State, Justice, and Commerce, the Judiciary and Related Agencies appropriations, 1,101 pp., printed. Covered is testimony on funds for Small Business Administration, Special Representative for Trade Negotiations, and U. S. Tariff Commission.

**TECHNOLOGICAL LABORATORY LAND IN MARYLAND:** H. R. 9334 (Morton) introduced in House, June 22, 1965, to provide for the conveyance of certain real property of the United States to the State of Maryland; to Committee on Interior and Insular Affairs. Property affected includes site of Bureau of Commercial Fisheries Technological Laboratory, College Park, Md.

**TERRITORIAL SEA AND CONTIGUOUS ZONE CONVENTION:** H. R. 9530 (Downing) introduced in House June 29, 1965, to protect coastal fishery and other resources by implementing the Convention on the Territorial Sea and the Contiguous Zone; to Committee on Merchant Marine and Fisheries.

**TRADE EXPANSION ACT:** Introduced in House H. R. 9131 (Herlong) June 16 and H. R. 9191 (Betts) June 17, 1965, to amend the Trade Expansion Act of 1962; to Committee on Ways and Means.

Rep. Dent in Congressional Record, June 23, 1965 (pp. 13993-13995), stated that he was in full accord with the legislation to amend the Trade Expansion Act of 1962 and was happy to join in the introduction of it. Also, he said: "I will support this legislation as a holding device, to hold onto our industrial competitiveness in our own markets . . . ."

Rep. Sikes in Congressional Record, June 30, 1965 (p. 14738-14739), pointed out that he is convinced that the Trade Expansion Act of 1962 is in need of amendment and referred to his bill, H. R. 9335, which would relax the requirements for relief in cases of industries, worker groups, or companies hurt as a result of tariff reductions or imports. Rep. Thomson in Congressional Record, July 6, 1965 (pp. 15116-15117), spoke in the House on the Trade Expansion Act of 1962 and urged amendment of the Act to provide a remedy for injury to domestic industry from imports. He stated that nearly 40 percent of our total imports come in free of duty--among examples given were shrimp, lobsters, and frozen tuna.

H. R. 9654 (Baring) introduced in House July 7, 1965, to amend the Trade Expansion Act of 1962; to Committee on Ways and Means. Rep. Baring in Congressional Record, July 7, 1965 (pp. 15185-15186) stated, "I believe that the Trade Expansion Act of 1962 was not good legislation and feel that the time has come when it needs to be changed." He pointed out that the bill he was introducing would not prevent all tariff reductions; but it would remove from the President's list products that are already imported in volume and need no further encouragement to capture more of our market. It would also make possible the limitation of imports through import quotas if imports in recent years have increased as much as 75 percent and have already risen to at least 7½ percent of domestic production.

**VESSEL MEASUREMENT:** S. 2142 (Magnuson) introduced in Senate June 14, 1965, to simplify the admeasurement of small vessels; to Committee on Commerce. Sen. Magnuson inserted in Congressional Record, June 14, 1965 (pp. 12962-12964), a letter and analysis from the Secretary of the Treasury requesting the proposal. Purpose of the bill is to substitute for the present intricate system of tonnage computation based on detailed physical measurement of the hull and deck structure a simplified method, at the owner's option and for pleasure vessels only, which would permit the assignment of tonnages on the basis of the products of a vessel's length, breadth and depth, and appropriate coefficients. Bill is identical with S. 2793 introduced in 88th Congress.

**WATER POLLUTION CONTROL ADMINISTRATION:** Rep. Kunkel in Congressional Record, June 14, 1965 (p. 12926), remarked that a Water Quality Act passed the Senate Jan. 28 and the House Apr. 28. The two versions of the legislation differ, which is not unusual. "What is unusual is that the Senate, whose turn is next, has gone this long without indicating whether it accepts the House version or whether it wants a joint conference to work out the differences."

**WATER PROJECT RECREATION ACT:** Committee of Conference submitted to House June 22, 1965, report (H. Rept. 538) and statement on S. 1229, to provide uniform policies with respect to recreation and fish and wildlife benefits and costs of Federal multiple-purpose water resource projects, and for other purposes.

H. Rept. 538, Uniform Policies on Multiple-Purpose Water Resource Projects (June 22, 1965, report from the Committee of Conference, U. S. House of Representatives, 89th Congress, 1st session, to accompany S. 1229), 9 pp., printed. Committee recommended that Senate recede from its disagreement to the amendment of the House and agree to same with an amendment. The amendment amplifies the policy of the Congress and intent of the Act. Includes statement of managers on the part of the House. Act provides for uniform policies with respect to recreation and fish and wildlife benefits and costs of Federal multiple-purpose water resource projects.

House June 23, 1965, by a voice vote adopted the conference report on S. 1229, and sent the legislation to the Senate. A statement on the part of the managers of the House was inserted in the Record, which details the agreement between the House and Senate.

Senate June 25, 1965, adopted conference report on S. 1229. Motion to reconsider this action was tabled, S. Con. Res. 40, to provide for correction in the enrollment of S. 1229 was adopted by the Senate June 25 and the House June 28.

**Note: REPORT ON FISHERY ACTIONS IN 88TH CONGRESS:** The U. S. Bureau of Commercial Fisheries has issued a leaflet on the status of all legislation of interest to commercial fisheries at the end of the 88th Congress. For copies of MNL-3--"Legislative Actions Affecting Commercial Fisheries, 88th Congress, 1st Session 1963 and 2nd Session 1964," write to the Fishery Market News Service, U. S. Bureau of Commercial Fisheries, 1815 N. Fort Myer Drive, Room 510, Arlington, Va. 22209. Requests for this leaflet will be filled on a first-come first-served basis until the supply is exhausted.





# RECENT FISHERY PUBLICATIONS

## FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON, D. C. 20240. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.  
FL - FISHERY LEAFLETS.  
MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.  
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.  
SL - STATISTICAL LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.  
SSR. - FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

- | Number   | Title   |
|----------|---|
| CFS-3694 | - Pacific Coast Fisheries, 1963 Annual Summary, 12 pp.          |
| CFS-3767 | - New Jersey Landings, 1964 Annual Summary, 11 pp.              |
| CFS-3773 | - New York Landings, 1964 Annual Summary, 12 pp.                |
| CFS-3780 | - Frozen Fishery Products, March 1965, 8 pp.                    |
| CFS-3784 | - Gulf Coast Shrimp Data, 1964 Annual Summary, 55 pp.           |
| CFS-3785 | - Shrimp Landings, 1964 Annual Summary, 16 pp.                  |
| CFS-3786 | - Rhode Island Landings, December 1964, 3 pp.                   |
| CFS-3788 | - Maryland Landings, February 1965, 3 pp.                       |
| CFS-3789 | - Fish Meal and Oil, 1964 Annual Summary, 4 pp.                 |
| CFS-3790 | - Maine Landings, 1964 Annual Summary, 7 pp.                    |
| CFS-3793 | - New Jersey Landings, February 1965, 3 pp.                     |
| CFS-3794 | - Rhode Island Landings, 1964 Annual Summary, 7 pp.             |
| CFS-3796 | - New York Landings, February 1965, 4 pp.                       |
| CFS-3797 | - California Landings, February 1965, 4 pp.                     |
| CFS-3799 | - Virginia Landings, January 1965, 3 pp.                        |
| CFS-3801 | - Florida Landings, March 1965, 8 pp.                           |
| CFS-3803 | - Massachusetts Landings, December 1964, 9 pp.                  |
| CFS-3806 | - Louisiana Landings, February 1965, 3 pp.                      |
| CFS-3809 | - Massachusetts Landings, by Ports, 1964 Annual Summary, 15 pp. |

SL-163 - Firms Producing Breaded Shrimp, 1964, 2 pp.

Sep. No. 734 - An Experiment in Electrical Fishing with an Electric Field Used as an Adjunct to an Otter-Trawl Net.

Sep. No. 735 - Equipment Note No. 16--An Exploratory Fishing and Gear Research Buoy.

FL-411 - Care of Tropical Aquarium Fishes, 4 pp., revised Jan. 1965.

FL-436 - Commercial Possibilities and Limitations in Frog Raising, 4 pp., revised 1965.

FL-443 - Construction of a Garden Fish Pool, 4 pp., revised 1965.

FL-576 - Rotenone in Fish Pond Management, 7 pp., 1965.

SSR-Fish. No. 495 - Age and Size Composition of the Menhaden Catch Along the Atlantic Coast of the United States, 1961, with a Brief Review of the Commercial Fishery, by William R. Nicholson and Joseph R. Higham, Jr., 32 pp., illus., April 1965.

Annual Report of the Bureau of Commercial Fisheries Radiobiological Laboratory, Beaufort, N. C., for the Fiscal Year Ending June 30, 1963, Circular 204, 46 pp., illus., March 1965.

The American or Eastern Oyster, by Victor L. Loosanoff, Circular 205, 38 pp., illus., March 1965. The American or Eastern oyster (*Crassostrea virginica*) is the oyster of commerce of the Atlantic and Gulf coasts of the United States. This report discusses the environment in which it lives; its anatomy and physiology; its growth and reproduction; enemies of the oyster; the United States oyster industry--culture and methods of harvesting; and sanitary controls used in distribution.

Progress in 1962-63, Circular 206, 31 pp., illus., Feb. 1965. During the period July 1962-Dec. 1963, the Bureau of Commercial Fisheries' Biological Laboratory at Honolulu made significant new findings in the fields of tuna behavior, the oceanography of the trade-wind zone, the ecology of the skipjack and albacore, subpopulations of skipjack and big-eyed tuna, and Pacific-wide and Hawaiian Island oceanography--studies that were outgrowths of earlier exploratory investigations. In addition, the Laboratory participated in a survey of the fishery resources of the Indian Ocean. The entire program was aided by the completion of a new vessel, the Townsend Cromwell, one of the most modern in the Nation's oceanographic fleet. This report on the Honolulu Laboratory's accomplishments during that period includes a cover photo of the Cromwell as well as photos of the Charles H. Gilbert (another Bureau vessel), tuna under study, and other research subjects.

Fishery Bulletin, vol. 63, no. 3, 1964, 227 pp., illus., printed. Contains articles on: "Life history of lake herring in Lake Superior," by William R. Dryer and Joseph Beil; "Annotated bibliography on biology of menhaden and menhadenlike fishes of the world," by John W. Reintjes; "Ocean mortality and maturity schedules of Karluk River sockeye salmon and some comparisons of marine growth and mortality rates," by R. A. Fredin; "A method of measuring mortality of pink salmon eggs and larvae," by William J. McNeil; "Movements, growth, and rate of recapture of whitefish tagged in the Apostle Islands area of Lake Superior," by William R. Dryer; "Meristic variation in the hexagrammid fishes," by J. C. Quast; "Age, growth, sex ratio, and maturity of the whitefish in central Green Bay and adjacent waters of Lake Michigan," by Donald Mraz; "Feeding and growth of juvenile soft-shell clams, *Mya arenaria*," by Alden P. Stickney; "Combined effects of temperature and salinity on development of eggs and growth of larvae of *M. mercenaria* and *C. virginica*," by Harry C. Davis and Anthony Calabrese; and "A critical study of Pribilof fur seal population estimates," by D. G. Chapman.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BUREAU OF COMMERCIAL FISHERIES, RM. 510, 1815 N. FORT MYER DR., ARLINGTON, VA. 22209.

Number	Title
MNL- 5	- Denmark's Fisheries, 1964, and 1965 Trends, 11 pp.
MNL- 8	- Portugal's Fishing Industry, 1964, 28 pp.
MNL-23	- Fisheries of Chile, 1964, 22 pp.
MNL-34	- Fisheries of Greece, 1964, 7 pp.
MNL-56	- Norwegian Fisheries, 1964, 12 pp.
MNL-57	- Fisheries in the Federal Republic of Germany, 1964, 31 pp.
MNL-86	- Hong Kong's Fishing Industry, 1963-64, 21 pp.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, April 1965, 14 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif. 90731.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; prices for fish meal, oil, and solubles; for the month indicated.

California Fishery Market News Monthly Summary, Part II - Fishing Information, April 1965, 8 pp., illus. (U. S. Bureau of Commercial Fisheries, Tuna Resources Laboratory, P. O. Box 271, La Jolla, Calif. 92038.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the month indicated.

(Chicago) Monthly Summary of Chicago's Wholesale Market Fresh and Frozen Fishery Products Receipts, Prices, and Trends, Feb. and March 1965, 15 pp., each. (Market News Service, U. S. Fish and Wildlife Service, U. S. Customs House, 610 S. Canal St., Rm. 704, Chicago, Ill. 60607.) Receipts at Chicago by species and by states and provinces for

fresh- and salt-water fish and shellfish; and weekly wholesale prices for fresh and frozen fishery products; for the months indicated.

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, April 1965, 13 pp. (Market News Service, U. S. Fish and Wildlife Service, Rm. 608, 600 South St., New Orleans, 70130.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; Gulf menhaden landings and production of meal, solubles, and oil; fishery imports at Mobile, Ala., Morgan City and New Orleans, La., Miami, Fla., and Houston, Port Isabel, and Brownsville, Tex.; and sponge sales; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, April 1965, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va. 23369.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New England Fisheries--Monthly Summary, March and April 1965, 22 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston, Mass. 02210.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, and Provincetown), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the months indicated.

New England Fisheries--Annual Summary, 1964, by John J. O'Brien, 38 pp., illus., May 1965. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston, Mass. 02210.) Reviews the fishery marketing trends and conditions at the principal New England ports, and highlights of the Canadian fisheries. The latest developments in the purse-seine tuna and swordfish long-line fisheries, the fish meal market, and frozen fishery products are recounted. Also includes fishery landings and ex-vessel prices for ports of Boston, Gloucester, New Bedford, Provincetown, Portland, Rockland, Point Judith, and Stonington; and principal events in the Maine sardine fishery. In addition, contains data on monthly landings and ex-vessel prices, by species, at Boston and Atlantic Ave. fish piers. The appearance of this report is enhanced by a cover photo of the New England Fish Exchange.

New York City's Wholesale Fishery Trade--Monthly Summary--March 1965, 18 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York, N. Y. 10038.) Includes summaries and

analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the month indicated.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, April 1965, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl vessels reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

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The American Oyster, CRASSOSTREA VIRGINICA Gmelin, by Paul S. Galtsoff, Fishery Bulletin, vol. 64, 1964, 483 pp., illus., printed, \$2.75. A comprehensive biological study of Crassostrea virginica, this book opens with chapters on taxonomy, morphology and structure of the shell, the ligament, general anatomy, the mantle, labial palps, gills, and adductor muscle. Next, the transport of water by the gills, and respiration; the organs of digestion and food of the oyster; the circulatory system and blood; and the excretory and nervous systems are covered. Chapters on the organs of reproduction; eggs, sperm, fertilization, and cell cleavage; larval development and metamorphosis; and chemical composition of the oyster follow. Then the final chapter discusses in detail environmental factors affecting oyster populations--the positive factors of water movements, salinity, temperature, food, and bottom composition; and the negative factors of sedimentation, disease, competitors and predators, and pollution. This textbook was written for biologists, administrators, marine biology students, public health officers, and oyster growers. The author has succeeded in using the simplest possible language while still maintaining scientific accuracy.

"Electric rotary fish screens," by William M. Richardson, article, Progressive Fish-Culturist, vol. 27, no. 1, 1965, pp. 20-22, illus., processed, single copy 25 cents.

Progress in Sport Fishery Research, 1964, Circular 210, 119 pp., illus., processed, March 1965, 60 cents.

## MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

### AFRICA:

Articles from Tr Baltiskogo Nauch-Issled Inst Morskogo Rybn Khoz Okeanogr, vol. 9, 1963, printed in

Russian. Baltiiskogo Nauchno-Issledovatel'skii Institut Morskogo Rybnogo Khoziaistva i Okeanografii, Verkh. Krasnosel'skaia U1. No. 17, Moscow, U.S.S.R.

"Kharakteristika perspektivnykh rybopromyslovnykh raionov u poberezh'ya Ispanskoi Sakhary i Mavritanii" (A characterization of prospective fishery regions along the coasts of the Spanish Sahara and Mauritania), by R. G. Bernikov and E. S. Prosvirov, pp. 70-80.

"Nauchno-poiskovaya ekspeditsiya na RT 'Muksun' k yugozpadnomu poberezh'yu Afriki" (The scientific and exploratory expedition of the trawler "Muksun" to the southwest coast of Africa), by Yu. A. Komarov and S. K. Kuderskii, pp. 3-19.

### ALGAE:

"A list of algae from selected areas in Massachusetts," by E. E. Webber, article, Rhodora, vol. 63, no. 754, 1961, pp. 275-281, printed. New England Botanical Club, Inc., Botanical Museum, Oxford St., Cambridge, 38, Mass.

"Sarganin and chonalgin, new antibiotic substances from marine algae from Puerto Rico," by Noemi G. Martinez Nadal, V. Rodriguez Luz, and Carmen Casillas, article, Antimicrobial Agents and Chemotherapy--1963 (Proceedings of a Conference, 1963), pp. 68-72, illus., printed, 1964. American Society for Microbiology, 115 Huron View, Ann Arbor, Mich.

"Studies on the proteins, peptides and free amino acid contents in some species of marine algae from south-eastern coast of India," by E. J. Lewis, article, Review Algol, vol. 7, no. 1, 1963, pp. 15-25, printed. Institute of Science, Bombay, India

### ALMANAC:

The Nautical Almanac for the Year 1966, Catalog No. D 213.11:966, 311 pp., printed, 1964, \$3.25. U. S. Naval Observatory, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Provides data required for the practice of astronomical navigation at sea.

### AMBERGRIS:

"Ambra" (Ambergris), by M. V. Ivashin, article, Zoologicheskii Zhurnal, vol. 42, no. 7, 1963, pp. 1099-1103, illus., printed in Russian with English summary. Redaktsiia Zoologicheskogo Zhurnala, Podmosenskii per. d. 21, Moscow B-64, U.S.S.R.

### AQUATIC BIOLOGY:

Books on Aquatic Biology--Fresh Water and Marine, by Carl R. Keeler, 227 pp., processed, 1965. Facile Press, 2306 Mission Rd., Tallahassee, Fla. This list of nearly 2,000 titles of aquatic biology texts includes only those currently in print and published in English. It is international in scope, covers all phases of the subject from algae to mammalia, and includes many Russian works. In addition to listing the books by 55 subjects, it includes an author index and publishers' addresses. Of particular interest are the subject sections on algae, mollusca, arthropoda, pisces, reptilia, behavior, distribution, and economic aspects. This list should be of value to teachers and researchers in the natural sciences throughout the world.

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#### AUSTRALIA:

Annual Report of the Division of Fisheries and Oceanography, 1963-64, 81 pp., printed, 1964. Commonwealth Scientific and Industrial Research Organization, Cronulla, N. S. W., Australia.

Articles from Australian Fisheries Newsletter, vol. 24, 1965. Fisheries Branch, Department of Primary Industry, Canberra, Australia.:

"Australians eat more fish but most of it imported," by P. C. Pownall, no. 4, April, p. 23.

"Record 1963/64 fin fish catch"; "Drop in local fish most marked in New South Wales"; "Australian marine and freshwater fisheries production, 1963/64," no. 3, March, pp. 5, 23, 32, 24-26. Although Australian finfish production for the 1963/64 financial year was a record 89.7 million pounds, there was a sharp drop in landings of some popular food fish such as mullet, flathead, and whiting. This trend is shown in an analysis by the Fisheries Branch of the annual table of marine and fresh-water edible fisheries, abstracted in these articles. Tuna production jumped from 11 to 18 million pounds; scallop production rose to 15.4 million pounds (landed weight) as a result of the opening of new beds in Port Phillip Bay, Victoria. Spiny lobster landings fell by nearly 4 million pounds, but shrimp catches increased by 6 percent, chiefly as the result of production from new grounds off Western Australia. The fish and shellfish production for each state (including Tasmania) is analyzed in the final article.

#### BELGIUM:

Rederscentrale vzw, Jaarverslag, 1964 (Annual Report of the Rederscentrale, 1964), 46 pp., printed in Dutch. Federscentrale v.z.w., H. Baelskaai 25, Oostende, Belgium. Contains two sections since "Rederscentrale" is not only a professional organization, but also a commercial organization, which under the minimum price system purchases fish that cannot be sold at the minimum prices at public auctions.

Articles from France Pêche, no. 93, March 1965, printed in French, single copy 2.5 F (about US\$0.50). France Pêche, Boîte Postale 179, Lorient, France.:

"L'aide a la pêche en Belgique" (Aid for the fisheries in Belgium), pp. 22-25, illus.

"La flotte de pêche Belge" (The Belgian fishing fleet), p. 26.

#### BOTULISM:

"Botulism from canned tuna fish," by R. W. Johnston, J. Feldman, and R. Sullivan, article, Public Health Reports, vol. 78, no. 7, 1963, pp. 561-564, printed. Public Health Service, U. S. Department of Health, Education, and Welfare, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

#### CANADA:

"Canada's fisheries exports reach all-time record," by T. R. Kinsella, article, Foreign Trade, vol. 123, no. 10, May 15, 1965, pp. 2-8, illus., printed, single copy C\$0.25. Queen's Printer, Government Printing Bureau, Ottawa, Canada. Exports of Canadian fisheries products reached an all-time record of C\$202.6

million in 1964, an increase of nearly 18 percent over 1963. Imports also rose during the period. This article discusses exports of Canadian fresh and frozen fish, salted and canned fish, mollusks and crustaceans, and industrial products. It also touches on fishery conferences, missions, and fairs held in 1964. The United States is one of the principal buyers of Canadian fishery products.

The Fisheries of Canada, 23 pp., printed. (Reprinted from Canada Year Book 1963-64.) Canada Year Book, Handbook and Library Division, Dominion Bureau of Statistics, Ottawa, Canada.

Available from Queen's Printer and Controller of Stationery, Ottawa, Canada.:

Fisheries Statistics, New Brunswick, 1963, Catalogue No. 24-204, 35 pp., illus., processed in French and English, May 1965, C\$0.75.

Fisheries Statistics, Ontario, 1963, Catalogue No. 24-209, 12 pp., illus., processed in French and English, April 1965, C\$0.50. Contains tables giving the value of fish landed in Ontario, 1956-1963; quantity and value of landings by species and fisheries districts, 1962-63; capital equipment used in the primary fisheries operations; number of persons engaged in the fisheries; and new capital investment in the commercial fishery.

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"Contribution to the marine life history of the eulachon, *Thaleichthys pacificus*," by W. E. Barraclough, article, Journal of the Fisheries Research Board of Canada, vol. 21, no. 5, 1964, pp. 1333-1337, illus., printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

#### CARP:

"Energeticheskii i belkovyi balans nagul'nogo karpovogo pruda" (Energy and protein balance of a carp feeding pond), by G. I. Shpet and T. V. Kozadaeva, article, Nauchnye Trudy Ukrain. Nauchno-Issledovatel'skii Institut Rybnogo Khoziaistva, vol. 15, 1963, pp. 27-43, printed in Russian. Four Continent Book Corp., 156 Fifth Ave., New York, N. Y. 10010.

"Genetic improvement of carp. V--A comparison of fall and winter growth of several carp progeny," by G. Wolfarth, M. Lahman, and Rom Moav, article, Bamidgeh, vol. 16, no. 3, 1964, pp. 71-76, illus., printed. Department of Fisheries and Fish Breeders' Association Nir-David, D. N., Hakirya, Israel.

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"Znachenie estestvennogo i iskusstvennogo korma pri vyrashchivani karpov-segoletkov" (The effect of natural and artificial foods on the rearing of carp finger-

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lings), by V. S. Kirpichnikov, article, Rybnoe khoz-yaistvo vnutrennykh vodoemov Latv. SSR (Fisheries of Latvian inland waters), vol. 7, 1963, pp. 339-346, printed in Russian. Akademii Nauk Latv. SSR, Riga, U.S.S.R.

#### CATFISH:

"Effect of forced activity on blood lactic acid in channel catfish, Ictalurus punctatus (Rafinesque)," by Charles Wax Caillouet, Jr., article, Dissertation Abstracts, vol. 25, no. 4, 1964, pp. 2668-2669, printed. University Microfilms, Inc., University of Michigan, 313 N. 1st St., Ann Arbor, Mich.

"One new species and two redescrptions of catfishes of the South American callichthyid genus Corydoras," by Stanley H. Weitzman, article, Proceedings of the United States National Museum, vol. 116, no. 3498, 1964, pp. 115-126, illus., printed. U. S. National Museum, Washington, D. C. 20560.

#### CHILLING AND FREEZING:

La Conservation par le Froid des Poissons, Crustacés et Mollusques (The Cold-Preservation of Fish, Crustaceans, and Mollusks), by France Soudan, Michel Anquez, and Alain Bénézit, Encyclopedie du Froid, 30 pp., illus., printed in French, 1965. J. B. Baillière et Fils, Editeurs, 19, Rue Hautefeuille, Paris 6e, France. Some of the chapters on cold-preservation of fish: anatomy and physiology; variation in composition (proteins, fats, other components) with the sexual cycle; chemical composition and decomposition; microbiology of fish; preservation by refrigeration; supplementary means of preservation--washing, evisceration, chemical preservatives; equipment for refrigeration and storage; ice-making; freezing of fish; freezing apparatus and procedures; and transport of frozen fish. Also contains chapters on: morphology, physiology, and chemical composition of crustaceans; their preservation by chilling and freezing; and mollusks and their chemical composition, bacteriology, and preservation by cold.

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"Biology of the Labrador and Newfoundland cod," by A. I. Postolakii, pp. 338-348, illus.

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"Size-age composition and spawning of the cod on the southwestern slope of the Flemish Cap Bank," by E. M. Mankevich and V. S. Prokhorov, pp. 349-354, illus.

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"K voprosu ob akklimatizatsii kamchatskogo i sinego krabov v Barentsevom more." (Introduction of the king crab, Paralithodes, and the blue crab into the Barents Sea), by Yu. I. Orlov, article, Materialy Rybkhozuyaistvennykh Issledovaniyakh Severnogo Basseina (Information on Fisheries Research in the Northern Basin), Part 1, pp. 46-47, printed in Russian, 1963. Gosudarstvennyi Komitet po Rybnomu Khoziaistvu pri SNKH SSSR; Poliarnii Nauchno-Issledovatel'skii i Proektnyi Institut Morskogo Khoziaistva i Okeanografii im. N. M. Knopovicha (PINRO), Murmansk, U.S.S.R.

#### DENMARK:

Articles from Dansk Fiskeritidende, vol. 83, no. 16, April 16, 1965, printed in Danish. Dansk Fiskeritidende, Studiestraede 3, 2, Copenhagen K, Denmark.

"Fisk for ekstra 800,000 kroner tilført Vesterø havn i 1964" (An extra 800,000 kroner worth of fish received at Vesterø port in 1964), pp. 217-219.

"77 millioner kg. fisk er blevet landet i de danske havne i Februar" (77 million kg. of fish were landed at Danish ports in February), pp. 207-208.

#### DOLLY VARDEN TROUT:

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*Proektirovanie i Stroitel'stvo Rybovodnykh Khozyaistv i Zavodov* (Design and Construction of Fish Farms and Fish Hatcheries), by B. A. Kaspin and others, 365 pp., illus., printed in Russian, 1964, 1 ruble, 30 kops. (about US\$1.45). Pishchepromizdat, Mruzoo-skii, Prospekt No. 1, Moscow, U.S.S.R.

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#### FISHERY AGREEMENT:

Japan and South Korea to Make a Fresh Start in Fisheries, by Masaaki Wada, 200 pp., printed in Japanese, 1965, 400 yen (US\$1.11 plus postage). Suisan Keizai Shimbunsha, 39 Banchi, Kita Higakubo-machi, Azabu, Minato-ku, Tokyo, Japan. Gives an insight

into the background of the recently concluded Japan-South Korea fishery agreement. Significant items described in this booklet are: (1) progress of negotiations and issues involved; (2) circumstances leading to the settlement; (3) points of agreement and commentaries on each item; and (4) procedure for implementing the agreement. It also has an appendix containing the provisions of the agreement, chronological summary of developments surrounding Japan-Korea fishery relations, data, and maps.

#### FISHERY RESOURCES:

*Biological Resources in the Tropical Areas of Three Oceans (Atlantic, Indian, and Pacific Oceans)*, by B. G. Bogorov, Paper No. E/Conf. 39/C/376, 5 pp., processed. (Translated from the Russian.) United Nations, New York, N. Y. 10017. Paper presented at the United Nations Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas, Geneva, Feb. 4-20, 1963.

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"Douze années de pêche à Boulogne" (Twelve years of fishing at Boulogne), by Jacques Lamarche, article, *France Pêche*, no. 93, March 1965, pp. 45-46, illus., printed in French, single copy 2.5 F (about US\$0.50). France Pêche, Boîte Postale 179, Lorient, France.

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Maritime News, P. O. Box 740, Slottsgt. 3, Bergen, Norway. This is the second part of a paper presented at the OECD (Organization for Economic Cooperation and Development) Meeting on Fish Technology, Sept. 14-17, 1964, Scheveningen, the Netherlands. Discusses the choice of vessel type--motherhip or independent freezer trawlers; transfer of catches at sea; problems of freezing whole gutted fish--maintenance of color, appearance, texture, and flavor; the choice of a freezing plant and a refrigerant; cold-storage methods; and thawing plant problems. It also covers the effects of subsequent freezing on fish; economic considerations such as accessibility of fish stocks, and use of cold storage to increase availability of fishery products to the consumer; other preservation methods--freeze-drying, super-chilling, treatment with antibiotics, irradiation sterilization and pasteurization; and the need for further research and exchange of ideas in the complex field of freezing fish at sea.

"What's new in food freezing," by S. A. Trout, article, Australian Refrigeration, Air Conditioning and Heating Journal, vol. 18, no. 6, June 1964, pp. 19-20, 23-24, printed. Australian Refrigeration, Air Conditioning, and Heating Institute, 62 Margaret St., Sydney, Australia. The latest developments in low-temperature freezing, fluidized freezing, and accelerated freeze-drying (A.F.D.) are discussed by the author.

#### FRESH FISH:

"Prime ricerche compiute in Italia sul riconoscimento del pesce congelato dal pesce fresco semplicemente refrigerato a mezzo di refrattometro a mano" (First investigations made in Italy on the differentiation between thawed frozen fish and chilled fresh fish, by means of a hand refractometer), by S. Caracciolo and L. Neri, article, Zooprofilassi, vol. 19, no. 3, March 1964, pp. 119-126, illus., printed in Italian. Zooprofilassi, Rome, Italy.

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"Extinct, rare and endangered American freshwater fishes," by Robert Rush Miller, article, Proceedings of the International Congress of Zoology, vol. 16, no. 8, 1963, pp. 4-11, illus., printed. Permanent Committee of International Zoological Congresses, 105 Blvd. Raspail, Paris 6e, France.

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"Chislennost' osetrovykh, lososevykh i sigovykh ryb Eniseya i sposoby ee uvelicheniya" (The abundance of sturgeons, salmonids and whitefishes in the Yenisei and ways of increasing their numbers), by A. V. Podlesnyi, pp. 155-161.

"Novyi metod otsenki nerestilishch presnovodnykh ryb po ikh lichinkam na primere ryb del'ty Volgi" (A new method of evaluating the spawning grounds of freshwater fish based on the distribution of larvae, illustrated by the fishes of the Volga delta), by A. F. Koblitskaya, pp. 201-210.

#### FROZEN FISH:

Correlation between the Histological Structure of Frozen Fish Muscular Tissue and its Post-Mortem

Changes, by A. I. Piskarev, article, paper presented at the 11th International Congress of Refrigeration, Munich, 27 Aug.-4 Sept. 1963, printed. Institut International du Froid, 177 Blvd. Malesherbes, Paris XVII, France.

#### GEAR:

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"Swimming speed of fish as a factor in gear research," by G. Sundnes, article, Fiskeridirektoratets Skrifter, Serie Havundersøkelser, vol. 13, no. 6, 1963, pp. 126-132, illus., printed. Fiskeridirektoratet, Bergen, Norway.

#### GERMAN DEMOCRATIC REPUBLIC:

Die Aufgaben der Wissenschaft bei der Weiterentwicklung der Binnenfischerei (The Problem of Further Development of the Inland Fisheries), by Diethelm Scheer, Reprint No. 1964/56, 4 pp., printed in German. (Reprinted from Deutsche Fischerei-Zeitung, vol. 11, no. 12, 1964, pp. 362-365.) Institut für Binnenfischerei, Muggelseedamm 310, Berlin-Friedrichshagen, Democratic Republic of Germany.

#### GERMAN FEDERAL REPUBLIC:

"La pesca marina en la República Federal Alemana" (The marine fishery in the German Federal Republic), article, Boletín de Informacion, no. 77, Feb. 1965, pp. 15-17, printed in Spanish. Sindicato Nacional de la Pesca, Paseo del Prado, 18-20, 6a Planta, Madrid, Spain.

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#### GILL NETS:

"O selektivnom deistvii na rybu stavnykh setei v usloviyakh Kamskogo vodokhranilishcha" (On the selective action of bottom gill nets under the conditions of the Kama Reservoir), by Yu. A. Pushkin, article, Izv Estestv-Nauch Inst Permskom Univ, vol. 14, no. 6, pp. 115-118, 1963, printed in Russian. Four Continent Book Corp., 156 Fifth Ave., New York, N. Y., 10010.

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## GREENLAND:

The West Greenland Cod Fishery, by David Garrod, Laboratory Leaflet (New Series) No. 7, 16 pp., illus., processed, March 1965. Fisheries Laboratory, Ministry of Agriculture, Fisheries and Food, Lowestoft, Suffolk, England. Declining yields elsewhere in the North Atlantic have led to a switch of British distant-water cod fishing effort to West Greenland. In this leaflet the commercial fishery prospects on those grounds are summarized. Included are a number of statistical tables and graphs showing total catch of cod from the Northwest Atlantic by areas of origin and by participating countries, 1952-63; cod catch per unit of effort by otter trawlers at West Greenland, 1954-62; and other similar data.

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"Nuevos metodos de industrialization de merluza en Chile. 1--Productos ahumados" (New methods of processing hake in Chile. 1--Dried products), by Enrique Torrejon, article, Informacion Conservera, vol. 13, no. 133, Jan. 1965, 4, 5-8, 9-11, illus., printed in Spanish, single copy 30 ptas. (about US\$0.50), Informacion Conservera, Colon, 62, Valencia, Spain.

## HERRING:

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"Nekotorye osobennosti povedeniya salaki v odnorodnom elektricheskom pole postoyannogo i impul'snogo tokov" (Some characteristics of the behavior of Baltic herring, *Clupea harengus membras*, in a direct-current electric field, both steady and pulsed), by G. P. Danyulite, article, Tr Akad Nauk Lit SSR, vol. B3, no. 32, 1963, pp. 181-194, printed in Russian. Akademii Nauk SSSR, Moscow, U.S.S.R.

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"A quantitative estimate of the number of Pacific herring (*Clupea pallasii*) in a spawning population," by D. N. Outram and F. H. C. Taylor, article, Journal of Fisheries Research Board of Canada, vol. 21, no. 5, 1964, pp. 1317-1320, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

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Sovereignty of the Sea, *Geographic Bulletin* No. 3, 34 pp., printed, May 1965, 25 cents. Bureau of Intelligence and Research, Office of Research in Economics and Science, U. S. Department of State, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) This Bulletin concerns the rights which the United States and other countries have on, over, and under the surfaces of the oceans. Precise distinctions of jurisdiction on land areas have their counterparts along and off the shores of six continents and hundreds of thousands of islands. The merchant marines and fishing fleets of several scores of countries must operate within the precepts of the law of the sea. Oil derricks and other marine operations in coastal waters signal further exploitation of the sea for which a legal framework must be developed. In the matter of fisheries, agreements between or among interested sovereign participants are recognized by the United States. In recent months American delegations have participated in conferences designed to consider feasible fishing rights off coasts where there have been problems and claimed infractions of international procedure. The Bulletin contains short chapters on the single

ocean concept, question of offshore jurisdiction, offshore pattern of zones, breadth of the territorial sea, double continental shelf, high seas and high flying, and international dissension over territorial waters. Appendices include articles on identifying and projecting a baseline, and boundaries in the sea. The tables show data on areas of the oceans and principal seas, coastline measurements of world's major political entities, and other information. Included are charts showing a continental shelf in profile, the baseline, the straight baseline, and median line boundaries between sovereign states with adjacent or opposite coasts.

#### LIVESTOCK FEED:

"Etude du besoin qualitatif d'azote chez la truie en gestation et lactation. Comparaison de deux proteines: Farine de poisson et arachide" (Qualitative nitrogen requirements in pregnant and lactating sows. A comparison between two proteins: Ground nut and fish meal), by E. Salmon-Legagneur, article, *Annales de Zootechnie* (Paris), vol. 13, no. 1, 1964, pp. 51-61, illus., printed in French. Institut National de la Recherche Agronomique, 149 Rue de Gronelle, Paris (7<sup>e</sup>), France.

#### LOBSTERS:

A Unit Suitable for Holding and Displaying Live Lobsters, by James E. Stewart and H. E. Power, *New Series Circular* No. 21, 8 pp., illus., processed, April 26, 1965. Halifax Laboratory, Fisheries Research Board of Canada, Halifax, N. S., Canada. Discusses a unit which has been built and tested in Canada, suitable for holding and displaying live lobsters in dining areas, stores, and other commercial establishments. It consists of a tank, its supporting structure, a controlled refrigeration system, a pumping and filtering system, and a small air pump to aerate the water. Some suggestions on maintenance, temperature, protection of lobsters from injury and toxicity are given, in addition to a full description and diagrams of the unit. A map showing lobster fishing seasons in eastern Canada is included.

#### MACKEREL:

"Okeanologicheskie orientiry pri poiske yuzhoafrikan-skoi stavridy v vesenne-letnii period" (Oceanologic indicators in the search for the South African horse-mackerel during the spring-summer period), by Yu. A. Khovanskii, article, *Tr Baltiskogo Nauch-Issled Inst Morskogo Rybn Khoz Okeanogr*, vol. 9, 1962, pp. 50-56, printed in Russian. Vsesoiuznyi Nauchno-Issledovatel'skii Institut Morskogo Rybnogo Khoziaistva i Okeanografii, Verkh. Krasnosel'skaia U1. No. 17, Moscow, U.S.S.R.

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Advances in Marine Biology. Vol. 2., edited by F. S. Russel, 284 pp., illus., printed, 1964, \$9.50, Academic Press, Inc., 125 E. 23rd St., New York, N. Y. 10010. The second volume of a new serial published to help biologists keep up with knowledge in the different lines of marine biological research. Contains articles which discuss the artificial propagation of marine fish; blood grouping of marine animals; the status of certain aspects of marine microbiology; and the sampling methods used in the benthos.

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to map large scale features such as the Gulf Stream are two research areas in which the Woods Hole Oceanographic Institution made early contributions. This report contains an introductory briefing, and chapters on currents and the shape of the Geoid; identification of water masses; sea ice; coastal geography, geology, and engineering; and security classification of information. A chapter on marine biology contains sections on marine biology and remote sensing; oceanographic observations from manned satellites for fishery research and commercial fishery applications; possible contributions of manned (and unmanned) satellites toward advancing the fields of marine biology and biological oceanography; transparency, bioluminescence, and plankton; and detection of marine organisms by an infrared mapper.

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Statsionara-Ural'skii Filial Akademiia Nauk SSSR, vol. 3, 1963, pp. 8-11, printed in Russian. Four Continent Book Corp., 156 5th Ave., New York, N. Y. 10010.

#### SOLE:

"Zheltoperaya kambala vostochnoi chasti Beringova morya (Kratkaya biologicheskaya kharakteristika)" (Yellowfin sole, *Limanda aspera* of the Bering Sea. A short biological characterization), by N. S. Fadeev, article, Tr Vses Nauch-Issled Inst Morskogo Rybn Khoz Okeanogr, vol. 48, 1963, pp. 281-291, printed in Russian. Vsesoiuznyi Nauchno-Issledovatel'skii Institut Morskogo Rybnogo Khoziaistva i Okeanografii, Verkh. Krasnosel'skaia Ul., No. 17, Moscow, U.S.S.R.

#### SOUTH AFRICA REPUBLIC:

"Anchovy project added another shoal fish to South African catch," article, The South African Shipping News and Fishing Industry Review, vol. 20, no. 4, April 1965, pp. 91, 93, 95, 97, illus., printed, single copy 30c (about US\$0.45). Thomson Newspapers, South Africa (Pty.) Ltd., Box 80, Cape Town, Republic of South Africa. The continuing expansion of the South African fishing industry has brought an increasing need for parallel services, according to the annual report of the Fisheries Development Corporation of South Africa, Ltd. covering the financial year ended Sept. 30, 1964. The Corporation, states this article, has kept pace by extending its activities to embrace the field of financial assistance, the construction and maintenance of fishing harbors, and research into new fish resources and the application of modern fishing methods. A highlight of the year's activities was the research on landings and processing anchovies, a resource not previously exploited in South African waters. While pilchard catches in South Africa declined, they remained abundant in South-West Africa.

Department of Nature Conservation, Report No. 20, 1963, 131 pp., illus., printed. Department of Nature Conservation, Provincial Administration of the Cape of Good Hope, Cape Town, Republic of South Africa. A section on work of the Division of Inland Fisheries contains accounts of: "Jonkershoek Fish Hatchery"; "Pirie Trout Hatchery"; "Stocking of public waters"; "A description of two small scale trials concerning carp growth," by D. J. van Schoor; "A report of a tour of freshwater fish hatcheries in Europe and the Middle East," by J. J. R. Louw; "A successful experiment in the control of algae by the use of freshwater fish in industry," by J. J. R. Louw; and other projects.

"The role of the South African fishing industry in feeding the nation," by G. M. Dreosti, article, South African Medical Journal, vol. 38, no. 29, 1964, pp. 631-640, printed. Medical Association of South Africa, Box 643, Cape Town, Republic of South Africa.

#### SOUTHWEST PACIFIC:

Studies in Microbial Ecology of the Australasian Region, by E. J. Ferguson Wood, Contribution No. 514, 204 pp., illus., printed, 1964. (Reprinted from Nova Hedwigia, vol. 8, 1964, pp. 5-54, 453-568, 39 tables.) Marine Laboratory, Institute of Marine Science, University of Miami, Miami 49, Fla. A study of the salinity-temperature relationships of a large num-

ber of species of diatoms and dinoflagellates and of their geographical distribution has shown that a number of populations can be discerned.

#### SPAIN:

"1964--noventa y dos unidades aumento la flota pesquera española" (1964--92 units were added to the Spanish fishing fleet), article, Industrias Pesqueras, vol. 39, no. 908, Feb. 15, 1965, pp. 78-79, printed in Spanish, single copy 40 ptas. (about US\$0.70). Industrias Pesqueras, Apartado 35, Vigo, Spain.

#### SPINY LOBSTER:

"The West's crayfishery and its future," by B. K. Bowen and R. G. Chittleborough, article, Australian Fisheries Newsletter, vol. 24, no. 3, March 1965, pp. 11, 13, 32, illus., printed. Fisheries Branch, Department of Primary Industry, Canberra, A.C.T., Australia. In the past 20 years the Western Australian spiny lobster catch has expanded spectacularly--from 600,000 pounds landed in 1944/45 to 21.5 million pounds in 1962/63. However, landings dropped to 18 million pounds in the 1963/64 season. Intense fishing has reduced the spiny lobster population to a point where the industry is now dependent each year on the recruitment into the commercial stock during the preceding closed season, according to the author. But if an adequate breeding stock is maintained and undersized individuals are protected, there is little reason why the population should not yield a relatively stable production in future years, he concludes.

#### SPRAT:

"Osezonnnykh izmeneniyakh povedeniya kaspiiskoi kil'ki v zone elektricheskogo osveshcheniya" (Seasonal variations in the behavior of (*Clupeonella*) Caspian sprats in areas illuminated by electric light), by B. I. Prikhod'ko, article, Trudy Kaspiiskogo Nauchno-Issledovatel'skii Institut Morskogo Rybnogo Khoziaistva i Okeanografii, vol. 17, 1962, pp. 58-64, printed in Russian. Four Continent Book Corp., 156 Fifth Ave., New York, N. Y. 10010.

#### STURGEON:

"Osetrovye yuzhnykh morei Sovetskogo Soyuza (Biologiya, promysel, vosproizvodstvo)" (Sturgeons of the southern seas of the U.S.S.R.), article, Tr Vses Nauch-Issled Inst Morsk Rybn Khoz Okeanogr, vol. 52, 1964, pp. 1-411, illus., printed in Russian. Vsesoiuznyi Nauchno-Issledovatel'skii Institut Morskogo Rybnogo Khoziaistva i Okeanografii, Verkh. Krasnosel'skaia Ul., No. 17, Moscow, U.S.S.R. One of the chapters is: "Biologiya osetrovnykh; ikh razvedenie i promysel. Ukazatel' literatury" (The natural history of sturgeons; their cultivation and fishery. A bibliography), by G. A. Potapova, pp. 348-402.

"Rezultaty akklimatizatsii aral'skogo shchupa (*Acipenser nudiventris* Lov.) v ozere Balkhash" (Results of the acclimatization of the Aral spiny sturgeon in Lake Balkhash), by N. V. Pechnikova, article, Voprosy Ikhtologii, vol. 4, no. 1, 1964, pp. 142-152, printed in Russian. Akademiia Nauk SSSR, Ikhtologicheskaya Komissiya, Moscow, U.S.S.R.

#### THAILAND:

A Review of the Flatfishes (Pleuronectiformes-Heterosomata) of the Gulf of Thailand and Its Tributaries in Thailand, by Supap Punpoka, Kasetsart University Fishery Research Bulletin No. 1, 92 pp., illus., printed,

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Dec. 18, 1964. The Faculty of Fisheries, Kasetsart University, Bangkok, Thailand. This is a new serial publication, initiated with the establishment of the Kasetsart University Museum of Fisheries in Bangkok.

#### TIDES:

Tide Tables--High and Low Water Predictions 1966--West Coast North and South America including The Hawaiian Islands, 224 pp., printed, 1965, \$2. Coast and Geodetic Survey, U. S. Department of Commerce, Washington, D. C. 20230.

#### TILAPIA:

"An attempt to increase the weight of *Tilapia melano-pleura*, a fish used in fish farming, with an anabolic steroid ethylestrenol," by R. E. Hutchison, article, *South African Medical Journal*, vol. 38, no. 29, 1964, p. 640, printed, Medical Association of South Africa, Box 643, Cape Town, Republic of South Africa.

"Preliminary experiments in cichlid hybrids," by J. Chervinski, article, *Bamidgeh*, vol. 16, no. 3, 1964, pp. 95-105, illus., printed, Department of Fisheries and Fish Breeders' Association, Nir-David, D. N., Hakirya, Israel.

#### TRADE LISTS:

The U. S. Department of Commerce has published the following mimeographed trade lists. Copies may be obtained by firms in the United States from the Commercial Intelligence Division, Office of International Trade Promotion, Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. 20230, or from Department of Commerce field offices at \$1.00 each:

Canneries and Frozen Foods Producers and Exporters--Chile, 6 pp., May 1965. Lists the names and addresses, size of firms, and types of products (including fish and shellfish) handled by each firm. Also contains trade and industry data on production and exports of fish and shellfish.

Canneries and Frozen Foods Producers and Exporters--Pakistan, 15 pp., April 1965. Lists the names and addresses, size of firms, and types of products (including fish and shrimp) handled by each firm. Also contains trade and industry data on production and exports of shrimp and fish.

Canneries and Frozen Foods Producers and Exporters--Turkey, 4 pp., May 1965. Lists the names and addresses, size of firms, and types of products (including fish) handled by each firm.

#### TRAWLERS:

"The changing pattern of trawlers," article, *Shipbuilding and Shipping Record*, vol. 102, no. 18, 1963, pp. 579-581, illus., printed, Shipbuilding and Shipping Record, 33 Tothill St., Westminster, London SW1, England.

#### TRAWLING:

"Relationship between engine power of a trawler and size of otter board," by T. Koyama, article, *Bulletin, Tokai Regional Fisheries Research Laboratory*, no. 33, 1962, pp. 29-32, printed in Japanese. Tokai Regional Fisheries Research Laboratory, Tsukishima, Chuo-ku, Tokyo, Japan.

"Results of a sampling program to determine catches of Oregon trawl vessels. 1--Methods and species composition," by Robert B. Herrman, article, *Pacific Marine Fisheries Commission Bulletin*, vol. 6, 1963, pp. 40-60, illus., printed, Pacific Marine Fisheries Commission, 741 State Office Bldg., 1400 SW. 5th Ave., Portland 1, Oreg.

"Study on the high-speed net on two-boat trawler equipped with controllable pitch propeller," by C. Hamuro, article, *Technical Report of Fishing Boat*, No. 17, 1963, pp. 35-54, illus., printed in Japanese with English abstract, Fishing Boat Laboratory, Production Division, Fisheries Agency, Ministry of Agriculture and Forestry, Kasumigaseki, Chiyoda-ku, Tokyo, Japan.

#### TRAWL NET:

"Instruments used for determination of parameters of trawl gear," by V. K. Savrasov, G. A. Traubenberg, and E. I. Zaitsev, article, *Rybnoe Khoziaistvo*, no. 1, 1963, pp. 37-47, illus., printed in Russian, Rybnoe Khoziaistvo, V. Krasnosel'skaia 17, Moscow, B-140, U.S.S.R.

"One-boat midwater trawl for industria' type fleet," by C. Nedelec, article, *France Peche*, no. 70, 1963, pp. 25-29, printed in French, France Peche, Boite Postale 179, Lorient, France.

Universal One-Boat Midwater and Bottom Trawl, by S. Okonski, paper presented at the Second World Fishing Gear Congress, London, 25-31 May 1963, 15 pp., illus., processed in English with French and Spanish abstracts. Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

#### TROUT:

"Storage life of vacuum-packed iced trout. I--Influence of packing material," by Poul Hansen and B. V. Jorgensen, article, *Journal of the Science of Food and Agriculture*, vol. 16, no. 3, March 1965, pp. 150-152, illus., printed, single copy £1 17s. 6d. (about US\$5.30). Society of Chemical Industry, 14 Belgrave Sq., London SW1, England. Reports on research conducted with gutted rainbow trout packed in two types of bag. Results showed that the storage life of gutted trout vacuum-packed individually in polyamide or polyethylene bags and kept in wet ice exceeded 2 weeks. The fish packed in polyethylene showed signs of slight fat oxidation at the end of the second week, while that in polyamide showed no fat oxidation throughout the experimental storage period of 3 weeks. Trout in both types of package suffered microbial spoilage during the third week. Viable aerobic microbial counts throughout the storage period were higher in polyethylene- than in polyamide-packed trout.

#### TUNA:

"Assessment of the quality of canned northern bluefin tuna *Kishinoella tonggol*. I," by A. R. Prater and W. A. Montgomery, article, *Journal of the Science of Food and Agriculture*, vol. 15, 1964, pp. 885-889, printed, single copy £1 17s. 6d. (about US\$5.25). Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

"Un equilibre rompu: L'organisation de la campagne thonière africaine 64-65" (A well-tried balance: the

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

organization of the African tuna season, 1964/65), article, *France Pêche*, no. 93, March 1965, pp. 30-31, illus., printed in French, single copy 2.5 F (about US\$0.50). *France Pêche*, Boîte Postale 179, Lorient, France.

#### TURTLES:

"Stirbt die suppenschildkroete aus?" (Has the soup turtle (*Chelonia mydas*) become extinct?), by Tom Harrisson, article, *Umschau*, vol. 64, no. 11, 1964, pp. 340-343, illus., printed in German. *Umschau-Verlag*, Frankfurt-am-Main, Federal Republic of Germany.

#### UNITED STATES GOVERNMENT:

United States Government Organization Manual, 1965-66, Catalog No. GS4.109:965, illus., printed, revised June 1, 1965, \$1.75. Office of the Federal Register, National Archives and Records Service, General Services Administration, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) The official organization handbook of the Federal Government. Describes the creation and authority, organization, and functions of the agencies in the legislative, judicial, and executive branches of the Government. Provides supplemental information on quasi-official agencies and selected international organizations. Includes about 40 charts showing the organization of the Government, Senate, House of Representatives, departments, and independent agencies. Provides information on executive agencies and functions of the Federal Government abolished, transferred, or terminated after March 4, 1933. Lists several hundred publications, showing the types of materials available from Government establishments. Contains the Constitution of the United States, its signers, and amendments to date. Also includes descriptions of agencies working in fisheries and related fields: Interagency Committee on Oceanography, U. S. Fish and Wildlife Service, Bureau of Commercial Fisheries, and Bureau of Sport Fisheries and Wildlife.

#### U. S. S. R.:

"Aklimatizatsiya tikhookeanskikh lososei v basseine Barentseva i Belogo morei. Materialy po biologii treski i morskikh mlekopitayushchikh Severa" (Acclimatization of Pacific Ocean salmon in the basins of the Barents and White Seas. Data on the biology of cod and of marine mammals of the North), article, *Trudy Polyarnogo Nauchno-Issledovatel'skii i Proektnogo Institut Morskogo Rybnogo Khoziaistva i Okeanografii*, vol. 15, 1963, pp. 1-279, illus., printed in Russian. *Poliarnii Nauchno-Issledovatel'skii i Proiktnyi Institut Morskogo Khoziaistva i Okeanografii im. N. M. Knipovicha*, Moscow, U.S.S.R.

"Berech' vodoemy, okhranyat' rybnye bogatstva" (Let us protect our waters and conserve our fish resources), by T. P. Zhilenko, article, *Okhrana Prirody na Dal'nem Vostoke* (Conservation of nature in the Far East), pp. 107-111, printed in Russian, 1963. *Okhrana Prirody na Dal'nem Vostoke*, Vladivostok, U.S.S.R.

"New canned product of Caspian sprat and herring," by V. C. Ten'kovskaya, article, *Rybnoe Khoziaistvo*, vol. 39, no. 7, 1963, pp. 72-73, printed in Russian. *Rybnoe Khoziaistvo*, V. Krasnosel'skaia 17, Moscow, B-140, U.S.S.R.

"Reka Samur i ee rybokhozyaistvennoe znachenie" (The Samur River and its fishery importance), by Yu. Saidov, article, *Voprosy Kompleksnogo Ispol'zovaniya i Okhrany Vodnykh Resursov AzerbSSR* (Problems of the Rational Utilization and Protection of Water Resources of Azerbaijan), pp. 160-162, printed in Russian, 1963. *Akademiia Nauk Azerbaidzh. SSR*, Baku, Azerbaijan S.S.R.

Rybnye Zapasy Aral'skogo Morya i Puti Ikh Ratsional'nogo Ispol'zovaniya (Fish Resources of the Aral Sea and Methods of Rational Utilization), 194 pp., illus., printed in Russian, 1964, 1 Ruble 20 Kop. (about US\$1.35). "Nauka," Tashkent, U.S.S.R.

"Soviet fishery investigations and fishing in the Northwest Atlantic," by V. I. Travin and L. N. Pechenik, article, *Soviet Fisheries Investigations in the Northwest Atlantic* (Translation), pp. 4-54, illus., printed, 1964. U. S. Department of Commerce, Clearinghouse for Federal Scientific and Technical Information, Port Royal and Braddock Rds., Springfield, Va. 22151.

"K voprosu ob istorii rybnoi promyshlennosti Kamchatki" (On the history of Kamchatka fisheries), by V. S. Gorelik, article, *Tr Dal'nevost Tekhnol Inst Rybn Prom Khoz*, vol. 3, 1963, pp. 5-17, printed in Russian. *Four Continent Book Corp.*, 156 Fifth Ave., New York, N. Y. 10010.

Articles from *Rybnoe Khoziaistvo Vnutrennykh Vodoemov LatvSSR* (Fisheries of Latvian Inland Waters), vol. 7, 1963, printed in Russian. *Akademiia Nauk Latvii SSR*, Riga, Latvia:

"Ob okhrane i vosproizvodstve rybnikh zasposov v Estonskom SSR" (On the conservation and replacement of the fish resources in the Estonian SSR), by N. V. Genina, pp. 357-362.

"Pitanie i rost molodi promyslovyykh ryb v ozerakh Latvii" (Food and growth of young commercial fishes in Latvian lakes), by R. Yu. Laganovskaya and Ya. Ya. Sloka, pp. 227-232.

"Sostoyanie i perspektivy razvitiya rybnogo khoziaistva na vnutrennykh vodoemakh Litovskoi SSR" (Conditions of Lithuanian inland water fisheries and prospects of their growth), by R. S. Vol'skis, pp. 363-367.

Articles from *Rybnoe Khoziaistvo Vnutrennykh Vodoemov SSSR* (Fisheries of the Inland Waters of the U.S.S.R.), printed in Russian, 1963. *Akademiia Nauk SSSR*, Moscow, U.S.S.R.:

"Biologicheskie i rybokhozyaistvennye issledovaniya v basseine Dona vyshe Tsimlyanskogo vodokhranilishcha i puti ratsionalizatsii rybnogo khozyaistva Verkhnego Dona" (Biological and fish-cultural studies in the Don Basin above the Tsimlyansk Reservoir, and measures for a rational fishery on the Upper Don), by A. V. Fedorov, pp. 181-184.

"Sostoyanie i perspektivy razvitiya ratsional'nogo rybnogo khoziaistva na vnutrennykh vodoemakh Vostochnoi Sibiri" (Condition and prospects of developing a rational fishery in the inland waters of Eastern Siberia), by A. G. Egorov, pp. 193-200.

"Sostoyanie i perspektivy razvitiya rybnogo khozyaistva na ozerakh, rekakh i vodokhranilishchakh SSSR"

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(The present state and prospects of the fishing industry in lakes, streams and reservoirs of the U.S.S.R.), by P. L. Pirozhnikov, pp. 4-21.

#### VESSELS:

"Fiberglass pilchard vessel has speed of 11.2 knots," article, The South African Shipping News and Fishing Industry Review, vol. XX, no. 2, Feb. 1965, pp. 77, 79, illus., printed, single copy 30 c. (about 45 U. S. cents). Trial runs of the Gunfi, a fiberglass pilchard vessel, indicated that the speed, stability, and maneuverability were up to expectations and excellent. According to the boatbuilder, fiberglass is the material of the future for fishing boat hulls, and "not many years will pass before the fiberglass hull will be as familiar in the shoal fishing fleets as the wooden hull is today." The vessel is 74 ft. long overall, has a beam of 21½ ft., a molded depth of 11 ft., and a draught of 7 ft. forward and 4 ft. aft. With those dimensions, she is only 70 gross tons and can carry 130 tons of fish in her hold. The vessel is fitted with a double bottom and has 2 ballast tanks in the bows. She is built to Lloyd's rules for hulls of fiberglass, and hull frames and bulkheads are all constructed of fiberglass. The deck is also of fiberglass but has a wood plank overlay to serve as a working surface. The stern and keel are of wood which has also been used for the rubbing boards and gunwales. The deckhouse, funnel, and other superstructure are of fiberglass and the masts are of steel.

Modern Fishing Vessels, by Z. Grzywaczewski and others, OTS61-II362, 303 pp., illus., printed, 1964, \$3. (Translated from the Polish, Wspolczesne Statki Rybackie, Wydawnictwo Morskie, Gdynia, 1959.) This book contains detailed information on modern fishing vessels and gear, with particular emphasis given to those produced in Poland. The introduction discusses the development of fisheries, both worldwide and in Poland. Part I, fishing vessels as means of production, has chapters on: fishing vessel classification, requirements, characteristics; trawlers and other demersal fish-catching vessels; those designed for the pelagic fisheries; factoryships and auxiliary vessels; and present and future Polish craft. Part 2, power plants of fishing vessels, covers steam power plants, internal combustion engine power plants, the problem of utilization of engine power, and rudder systems. Part 3, equipment, discusses types of gear; navigation, radio and fish-finding devices; and lifesaving appliances. The final part, industrial installations in vessels, includes chapters on processing methods; machines and processing installations on board; refrigerating plants; and mechanization of transport--conveyors, hoists, problems of transshipment.

Study on the Development of Fishing Boat Design Based on Waveless Hull Form Theory, by N. Yokoyama, Scientific Report No. 5, 132 pp., printed in Japanese, 1961. Fishing Boat Laboratory, Production Division, Fisheries Agency, Ministry of Agriculture and Forestry, Kasumigaseki, Chiyoda-ku, Tokyo, Japan.

#### WEATHER CHARTS:

Heavy Weather Guide. Part I--Hurricanes, by Edwin T. Harding; Part II--Typhoons, by William J. Kotsch, 220 pp., illus., printed, 1965, \$6. United States Naval Institute, Annapolis, Md. 21402. Sweeping up

from tropical zones into the colder latitudes of the northern hemisphere, vast cyclonic storms each year leave in their wakes death and devastation. In the Atlantic those storms are called hurricanes; in the Pacific, typhoons. Both kinds of storms carry inconceivable amounts of energy and have greater potential for destruction than the most powerful A-bombs. The purpose of this book is to discuss the theory, origin, and habits of those storms, and to show how to evade or survive them. The book treats hurricanes and typhoons separately, even though in most ways hurricanes and typhoons are alike. The reader, whether he is a vessel skipper, weekend sailor, or shoreside dweller, can learn about those storms from this book without actually experiencing one. Part I, on hurricanes, discusses the tropics, the hurricane's formation, its characteristics, the killer side of the storms, the Hurricane Warning Service, tips on protection at sea or ashore, and the future of hurricane forecasting and control. Part II, on typhoons, covers some topical tropical words, phrases, and concepts; the formation of a typhoon; its characteristics; forces of destruction; the typhoon's life cycle and dissipation; the effect of interaction of two typhoons--Fujiwhara effect; the typhoon-warning system; tips on protection afloat and ashore; and outlook for the future. The appendixes contain some excellent writings by weather authorities on the killer storms. This is a well-illustrated book containing many weather charts and diagrams.

Processed weather charts are published by the Weather Bureau, U. S. Department of Commerce, Washington, D. C., and are for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402, 10 cents each. Charts show stations displaying small craft, gale, whole gale, and hurricane warnings; explanations of warning displays; and schedules of AM and FM radio, TV, and radiophone stations that broadcast weather forecasts and warnings:

Coastal Warning Facilities Chart, Eastern Florida, 1965, Catalog No. C30.22/3:F 66/965.

Coastal Warning Facilities Chart, Morgan City, La., to Apalachicola, Fla., 1965, Catalog No. C30.22/3:M 82/965.

#### WHALING:

"International Whaling Commission, Chairman's Report on the Sixteenth Meeting," by M. N. Sukhoruchenko, article, Norsk Hvalfangst-Tidende (The Norwegian Whaling Gazette), vol. 54, no. 2, Feb. 1965, pp. 25-30, printed. Hvalfangerforeningen, Sandefjord, Norway. Reviews the order of business and work accomplished at the 16th Meeting of the Commission, held at Sandefjord, June 22-26, 1964. Discusses the previous season's (1963/64) whale catch, a report on the whale stocks in the Antarctic, blue-whale unit limitation proposals, protection of the humpback in the North Atlantic and of the blue whale in both the North Atlantic and the Antarctic, and protection of sperm whales. The report also covers North Pacific whale stocks, blood-typing, the Sanctuary and open season, taking of gray or right whales, the observer plan, infractions of rules in the Antarctic during 1963/64 season, and other items of discussion.

#### WHITEFISH:

"Akklimatizatsiya sigovykh ryb v Latviiskoi SSR" (Acclimatization of whitefishes in the Latvian S.S.R.), by G.

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P. Andrushsis, article, Rybnoe Khozyaistvo Vnutrennykh Vodoemov Latviiskoi SSR (Fisheries of Latvian

Inland Waters), vol. 7, 1963, pp. 211-214, printed in Russian. Akademii Nauk SSSR, Institute Okeanologii, Moscow, U.S.S.R.



#### CORRECTION

The June 1965 issue, page 97, showed this report, *Gesammelte Sonderdrucke aus dem Institut für Hydrobiologie und Fischereiwissenschaft der Universität Hamburg 1963* (Collected Reprints from the Institute for Hydrobiology and Fisheries Science of the University of Hamburg, 1963), incorrectly under country heading GERMAN DEMOCRATIC REPUBLIC. The correct country heading should have been GERMAN FEDERAL REPUBLIC.



#### RING-AROUND-ROSY TUNA MACARONI CASSEROLE

Here's a grand tuna macaroni casserole designed for the busy mom by the Tuna Research Foundation. Ring-Around-Rosy Casserole is a snap to make and it's as nutritious and thrifty as you can get. Convenient canned tuna's high in protein. Condensed tomato soup, evaporated milk, and American cheese combine to add their own nutritional advantages in a smooth and tasty sauce that's a breeze to prepare.

You can make this casserole ahead of time, the day or night before you go shopping, and store it in the refrigerator. Then if you get stuck at the department store and are late getting home, all you have to do is heat and serve. It's child's play. (If you have a teenage daughter, you might tell her that. And ask her to set the table, too. Then you'll really have it made!)

#### RING-AROUND-ROSY TUNA MACARONI CASSEROLE

- 4 ounces elbow macaroni
- 1 can condensed tomato soup
- $\frac{2}{3}$  cup evaporated milk
- 2 cans ( $6\frac{1}{2}$  or 7 ounces each) tuna
- in vegetable oil
- 1 cup grated process American cheese, divided

Cook macaroni according to package directions. Drain and reserve. Combine tomato soup and evaporated milk. Add macaroni, tuna, and  $\frac{1}{2}$  cup of the grated cheese. Turn into a greased  $1\frac{1}{2}$ -quart casserole; sprinkle remaining cheese around edge. Bake in 350° F. oven for 25 minutes. Or prepare early and refrigerate; then bake 45 minutes. Makes 4 servings.



### DETERMINING AGE OF ALBACORE TUNA

Albacore fishermen, like fishermen everywhere, often wonder about the size of the fish they catch, and how many years it takes for an albacore tuna to reach a certain size. How old is a 28-pound albacore. How long will it take a 9-pound fish to grow that big to 28 pounds?

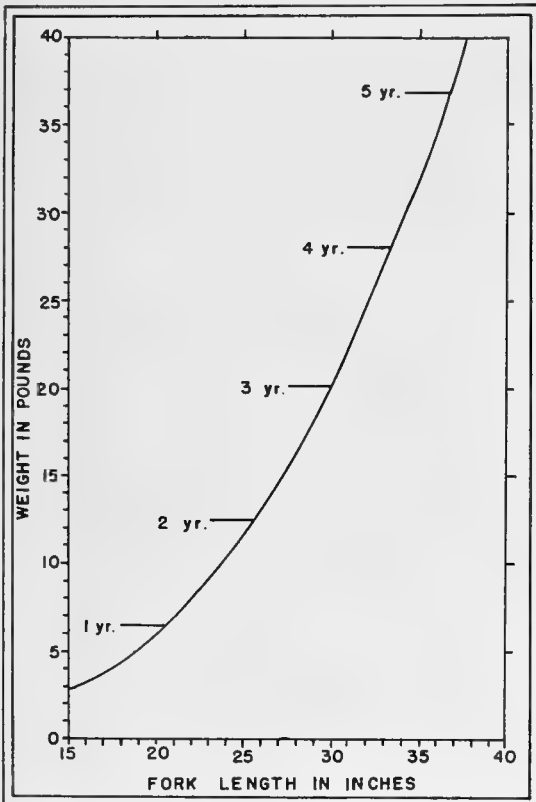


Fig. 1 - Chart shows the weight-length-age relationship of Pacific albacore tuna. If the length or weight of the fish is known, this chart will enable you to determine the other measure and its age.

occurs at the same time each year, the resulting band of crowded circuli is an annulus, and the area between annuli is equal to a year's growth. By examining scales under a microscope and counting these annuli the age of the fish can be determined.

Biologists of the California State Fisheries Laboratory weighed, measured, and read the ages of numerous albacore tuna and then prepared a graph so anyone may estimate the ages of any albacore caught if either length or weight is known.

The measurement to use is fork length--a straight-line distance from the tip of the snout to the fork in the tail. So, a 28-pound albacore would be 4 years old and measure 33 inches, while a 9-pound fish measuring 23 inches fork length would be on its way to becoming two years old when caught. (Outdoor California, April 1964.)



Fig. 2 - This scale from a two-year-old albacore tuna illustrates the crowding of rings or circuli to form two bands or annuli.

The subject of albacore age and growth is of interest to marine scientists, but early attempts to interpret age from scales, vertebrae, and other structures were unsatisfactory in one way or another. Recently, however, biologists at the California State Fisheries Laboratory, Terminal Island, developed a method for cleaning and staining fish scales, and by using it have succeeded in determining the ages of albacore tuna.

Growth on albacore scales, like many other fish, is recorded as ridges or rings called circuli. When growing rapidly the space between rings is wide; when growth is slow a series of closely spaced rings form. If slow growth occurs

## SMALL VESSEL DESIGN TO BE REVIEWED AT FAO CONFERENCE

The need for small fishing craft (under 100 gross tons) specially adapted for fishing local waters of developing countries will be the theme of the Food and Agriculture Organization's (FAO) Third International Technical Meeting on Fishing Boats, to be held at Goteborg, Sweden, October 23-29, 1965.

Social and economic factors as well as design problems will be reviewed by the 300 participants from 30 countries expected at the Goteborg meeting.

Since 1947 when the first international meeting on fishing boats was held at Goteborg, FAO has undertaken a number of missions to help developing countries improve their fishing vessels. Several thousand vessels have been built from FAO designs, and a wealth of experience has been gained, much of which will be reviewed at the coming meeting. (Food and Agriculture Organization, Rome, February 1965.)



Fig. 1 - A vessel designed by FAO experts in the 1950's to be operated from open beaches in India. FAO did pioneer work in India with small mechanized craft.



Fig. 2 - An FAO prototype vessel going through the surf after launching from an Indian beach.



Fig. 3 - A 31-foot vessel fishing for shrimp off the Indian coast. Equipped with a 31-horsepower engine, the vessel was built to an FAO design.



Fig. 4 - One of FAO's pioneer experimental vessels designed in the 1950's for work in Ceylon.

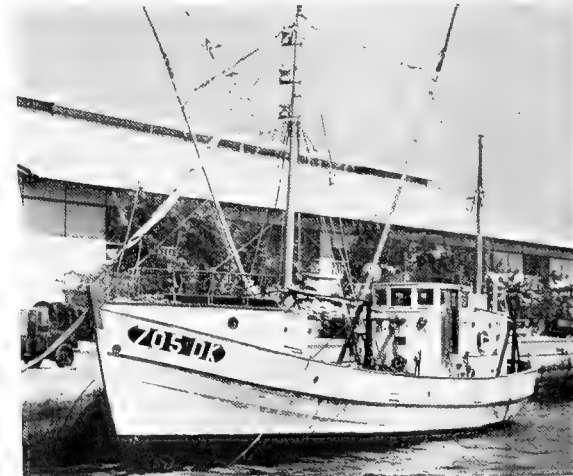


Fig. 5 - A Senegalese vessel used for trolling and trawling. The vessel was designed in 1947 by an FAO fisheries expert.

Note: For additional details on plans for the meeting see *Commercial Fisheries Review*, May 1965 page 50.





## HIGHLIGHTS IN THIS ISSUE (AUGUST 1965)



### \*\*\* Features \*\*\*

**HERRING FISHERY IN SOUTHEASTERN ALASKA**  
Use of this limited fishery by meal and oil processors (p. 1).

**YELLOWFIN TUNA FISHERY IN EASTERN TROPICAL ATLANTIC**  
Effects of water temperature on catch (p. 7).

### \*\*\* Research and Developments \*\*\*

Aluminum crimping sleeve for long-line gear eliminates electrolytic hook damage (p. 19).

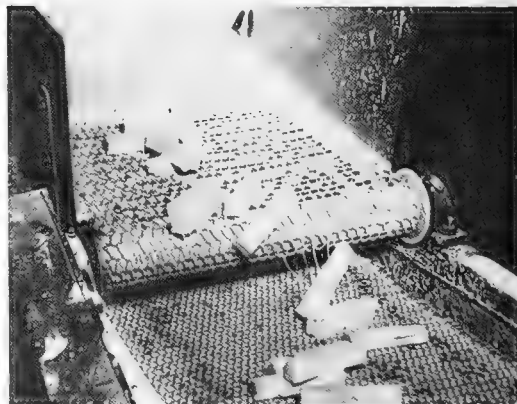
Blue Crabs--cleaner-debacker machine semiautomates crab picking (p. 25).

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Shrimp--U.S. breaded and canned pack production (p. 53).

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Vessels--plastic and aluminum alloys used in construction (p. 97); push-button controls for new stern-trawler (p. 84).



Fish sticks going through the batter at a New England frozen fishery products plant. New products and convenience foods develop new markets and expand fish consumption.

### \*\*\* Foreign Fisheries \*\*\*

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**JAPAN:** Trends in major fisheries--tuna, sardine, salmon, crab--excellent results in summer albacore pole-and-line fishery (pp. 73-80).

**MOROCCO:** Continues long-range tuna fishing (p. 88).

**SOUTH AFRICA REPUBLIC:** Fish meal market shortage causes concern (p. 93).

**SOVIET UNION:** Offers to exchange tuna fishing data with Japan (p. 77).

**VENEZUELA:** Seeks investors for new fishing venture (p. 97).

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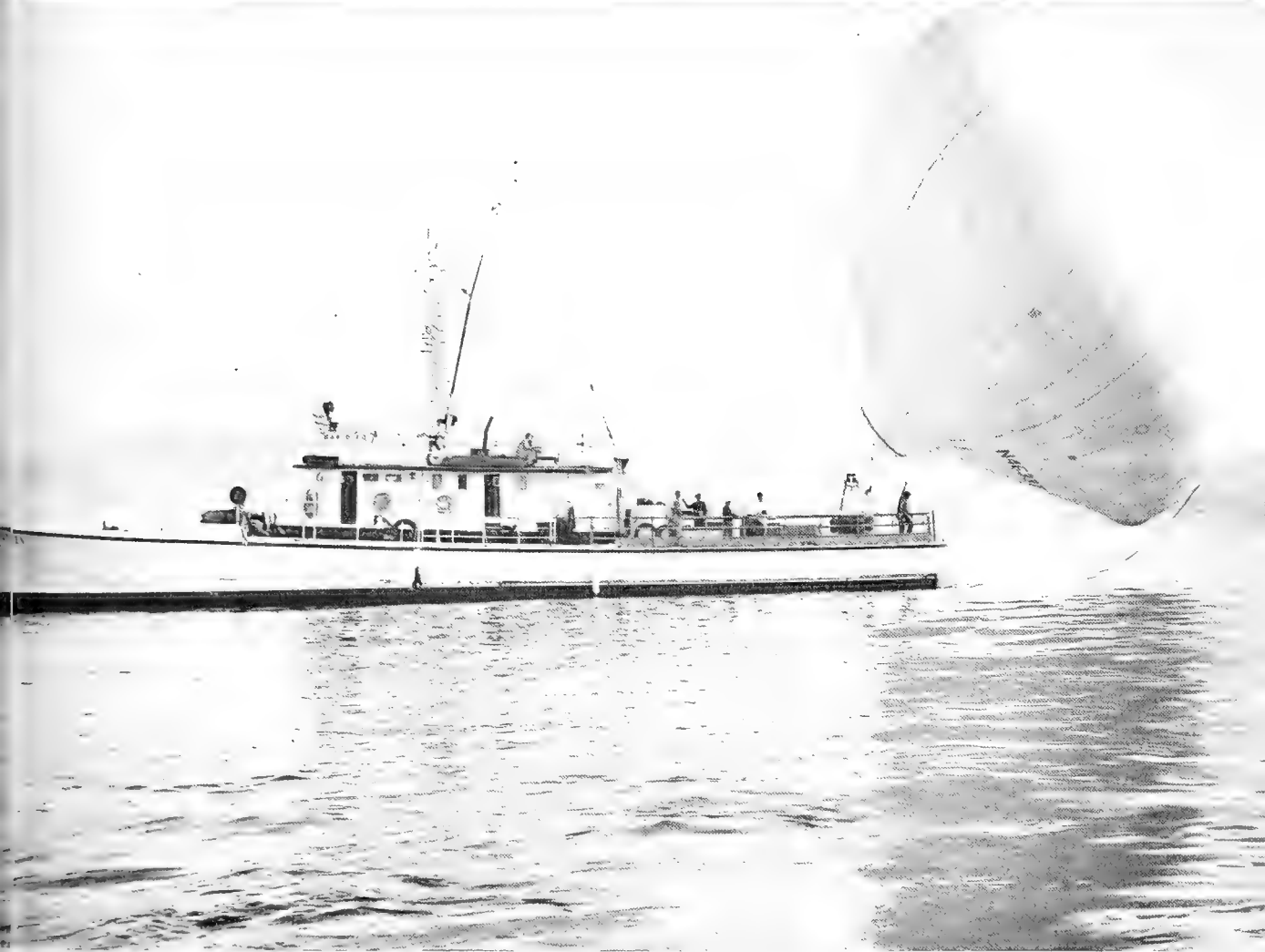
Youth Opportunity Campaign--Fishing Industry asked to help (p. 58).

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# COMMERCIAL FISHERIES REVIEW



VOL. 27, NO. 9

SEPTEMBER 1965

**UNITED STATES DEPARTMENT OF THE INTERIOR**  
**Fish and Wildlife Service**  
**Bureau of Commercial Fisheries**  
**Washington, D.C.**







# COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries  
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor  
G. A. Albano and H. Beasley, Assistant Editors

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5/31/68

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COVER: Balloons--a new approach to fish spotting. Shown is a hot-air balloon, 50 feet in diameter, being inflated from the deck of the albacore troller Yaqui Queen during tests off California in early 1965. Manned ascents were made with the balloon to a height of 500 feet--where visibility extends for 30 miles. The balloon was tethered to the Yaqui Queen by a 5/8-inch nylon line. The tests showed that the operation of a tethered hot-air balloon from a vessel at sea is safe and practical under a wide range of working conditions. Improvements in the design of the balloon are needed, however, so that it can be towed by a vessel without hindering its speed. (Note: Additional information about the balloon test may be obtained from the Tuna Resources Laboratory, U.S. Bureau of Commercial Fisheries, La Jolla, Calif. Also see Commercial Fisheries Review, May 1965 p. 18.)

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OCEANOGRAPHY STUDENTS TRAIN ABOARD  
U. S. BUREAU OF COMMERCIAL FISHERIES  
RESEARCH VESSEL

The U. S. Bureau of Commercial Fisheries Biological Laboratory, Woods Hole, Mass., has been cooperating with the Southern Maine Vocational Technical Institute in the training of students in marine technology. Courses in marine engineering, navigation, and oceanography at the Vocational Institute require experience at sea on a training vessel. The Bureau's laboratory agreed to accept a limited number of students on certain research cruises to afford them an opportunity to fulfill the experience requirement. Students selected for the cruise will be assigned to the engine-room, the deck, and the oceanography laboratory, depending on the course involved. Two students were aboard the Laboratory research vessel Albatross IV during February 1965, serving as assistants on the scientific party during the North Atlantic winter groundfish survey.



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\* \* \* \* \*

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# COMMERCIAL FISHERIES REVIEW

September 1965

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## BOTTOM TRAWLING SURVEYS OF THE NORTHEASTERN GULF OF ALASKA

(Summer and Fall of 1961 and Spring of 1962)

By Charles R. Hitz\* and Warren F. Rathjen\*

### ABSTRACT

The U. S. Bureau of Commercial Fisheries in cooperation with the International Pacific Halibut Commission used otter trawls to survey bottomfish and shellfish on the Continental Shelf and upper continental slope in the Gulf of Alaska. Much of the area surveyed was judged to be untrawlable with conventional bottom trawls used in the surveys. Flatfish made up 43 percent of the total catch of fish and invertebrates. The arrowtooth flounder or turbot was a dominant species at all depths, comprising 60 percent of the flatfish catch and 26 percent of the combined fish and invertebrate catch.

### INTRODUCTION

In the summer and fall of 1961 and spring of 1962 otter trawls were used to survey the bottomfish and shellfish on the Continental Shelf and upper continental slope in the Gulf of Alaska. The survey was part of a long-range program begun in 1950 to determine the size of bottomfish stocks in the northeastern Pacific Ocean between southern Oregon and northwest Alaska. The general purpose of the surveys has been to investigate all bottomfish in areas not being fished commercially. Results of previous investigations have been reported by Ellson, Knake, and Dassow 1949; Ellson, Powell, and Hildebrand 1950; Schaefers, Smith, and Greenwood 1955; Alverson 1951, 1953; Greenwood 1958; Johnson 1959; Hitz, Johnson, and Pruter 1961; Hitz and Alverson 1963.

The International Pacific Halibut Commission (IPHC) began a survey in 1961 in the Gulf of Alaska from Unimak Pass to Cape Spencer (fig. 1) to determine the availability of halibut and other bottomfish to trawl gear. Cooperating with the Commission, the U. S. Bureau of Commercial Fisheries assigned the chartered vessel *Tordenskjold* and the Bureau's research vessel *John N. Cobb* to survey that part of the Gulf from the west end of Kodiak Island to Cape Spencer (fig. 1). There has been a considerable amount of interest in what is available to trawl gear in that area, since the Soviets and Japanese began trawling in the Gulf of Alaska. The Soviets were trawling for bottomfish in the Gulf in 1960 on an exploratory basis and by 1963 were involved in large-scale commercial operations. Through 1963, Japanese activities were confined to exploratory fishing and limited commercial operations.

The data collected from both Bureau vessels during the survey have been incorporated with other data (Alverson, Pruter, and Ronholt 1964) into a general analysis of the distribu-

\*Fishery Biologists; the first author, Exploratory Fishing and Gear Research Base, Seattle, Wash.; and the second, Branch of Exploratory Fishing, Washington, D. C.; U. S. Bureau of Commercial Fisheries.

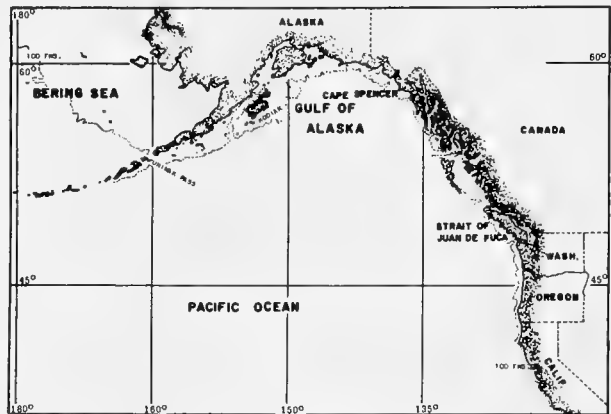


Fig. 1 - The Gulf of Alaska.

tion and relative abundance of demersal fish along the Pacific coast of North America, north of California. This study will relate the detailed features as shown by the surveys of the John N. Cobb and Tordenskjold in the Gulf of Alaska.

The Bureau's aims in this particular trawl survey were (1) to determine the general species composition and relative abundance of demersal fish and shellfish; (2) to obtain accurate records of the bottom topography for determining probable extent of trawlable grounds; and (3) using tags furnished by IPHC, to tag and return to the water all viable halibut captured.

### METHODS AND GEAR

A prescheduled sampling pattern was followed in measuring species composition and relative abundance of demersal fish and invertebrates. The sampling pattern followed an overall plan suggested by IPHC for the entire Gulf of Alaska region. The basic pattern provided stations 6 miles apart on sectors at each 15 minutes of longitude with the stations staggered from one sector to the next (fig. 2). Beyond the 100-fathom line the pattern provided stations at depths of 150 and 250 fathoms, regardless of the distance between stations. The lines of stations were numbered from west to east, and each station was designated by a letter of the alphabet starting from the closest station inshore and moving outward. Figure 2 shows the arrangement of the station lines and stations assigned to the Bureau of Commercial Fisheries. Lines 59 to 82 were the responsibility of the Bureau's Exploratory Fishing and Gear Research Base, Seattle, Wash., while lines 83 to 114 were assigned to the Exploratory Fishing and Gear Research Base, Juneau, Alaska.

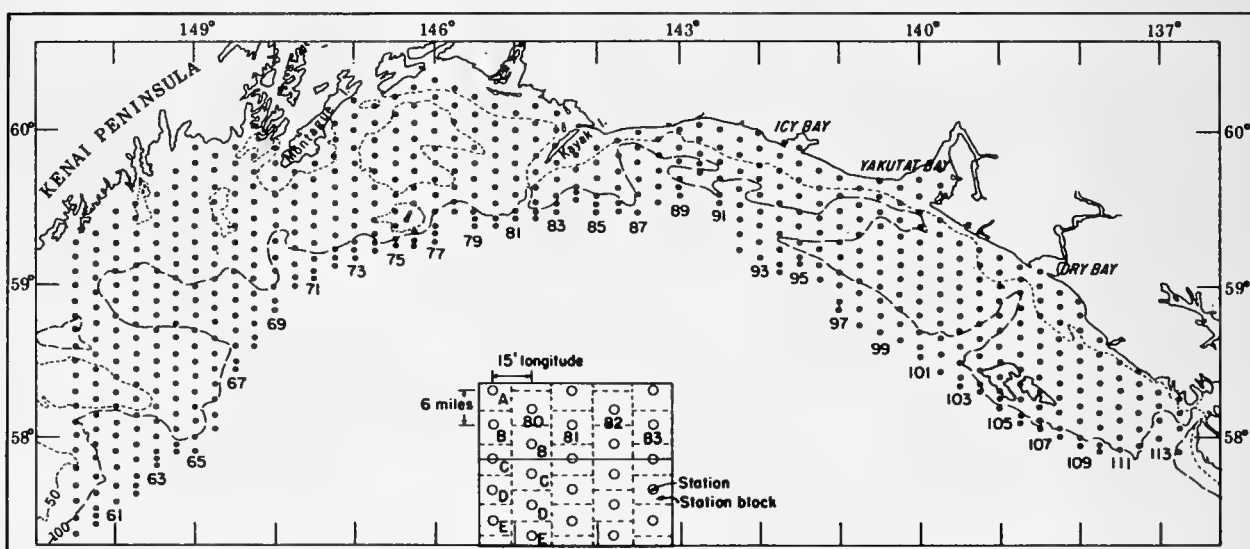


Fig. 2 - The basic pattern of the survey provided stations 6 miles apart on sectors at each 15 feet of longitude with stations staggered from one sector to the next.

Two vessels were used in surveying the Bureau's area. The Base at Juneau chartered a schooner-type trawler, the Tordenskjold (fig. 3). This vessel has an overall length of 75 feet, a beam of 18 feet, and a mean load draft of 9 feet (Greenwood 1958). The Base at Seattle used the Bureau's research vessel John N. Cobb (fig. 4). It is a West Coast purse seiner in general design with an overall length of 93 feet, a beam of 25 feet, and a mean load draft of 9 feet (Ellson 1950). Both vessels tow their trawls from the stern and haul over the starboard side; the Tordenskjold sets from the starboard side while the John N. Cobb sets over the stern.

A 400-mesh eastern otter trawl net (Greenwood 1958) with a  $1\frac{1}{2}$ -inch mesh liner, 100 meshes in length, placed in the cod end of the net to retain small organisms such as shrimp, was used to sample each of the stations. A snag cable 30 fathoms long and  $\frac{3}{8}$ -inch diameter



was attached between the otter boards and dragged on the ocean floor ahead of the net. By "hanging up" on bottom obstacles the snag cable minimized damage to the net.

A drag was attempted in each station block (fig. 2); however, since much of the ocean bottom was too rough for trawling, many stations could not be sampled. To determine if the bottom was trawlable, an echo-sounding transect was generally made along the station line. If the bottom appeared level and soft, a 1-hour drag was attempted.



Fig. 3 - The chartered vessel Tordenskjold, a schooner-type trawler.



Fig. 4 - The exploratory fishing and gear research vessel John N. Cobb.

Because of the limited time allowed to survey a rather large area, intensive echo-sounding transects could not be made. Thus, many of the sampling blocks judged to be untrawlable to sampling gear used in the described surveys may in fact contain trawlable grounds which could be located if more thorough echo-sounding surveys were made, or other types of trawl gear were used.

Aside from enumerating the catch, the following data were collected for each station. Location was determined by loran or radar bearings. Meteorological data were obtained and recorded. A sample of bottom sediments was obtained with a Dietz-LaFond bottom grab, and the bottom ocean temperature was taken with either a bathythermograph or a reversing thermometer at the end of each haul.

When obvious snags were not encountered during a haul, the otter trawl was towed for 1 hour. The catch was then brought aboard and dumped into checkers, where it was sorted by species and counts and weights of individual species were recorded. Ranges in lengths and weights were determined for each species. Length-frequency samples of the two dominant species were often obtained. Otoliths and scales were removed for subsequent age and growth determination from representative sizes of the dominant species encountered. When catches were larger than 5,000 pounds, subsamples were taken to determine quantities and sizes of each species.

During the sorting of the catch, all halibut weighing less than 40 pounds were placed into a live box, from which the viable ones were subsequently removed for tagging and release. The larger halibut that were not placed into the live box were tagged from the deck and returned to the sea immediately. Untagged halibut were measured, their sex determined, and the otoliths removed for age and growth studies made by IPHC.

#### AREA SURVEYED

The Continental Shelf in the Gulf of Alaska is relatively wide, extending some 50 miles seaward as it curves westerly towards Kodiak Island. The continental slope in that area is extremely steep and penetrated by numerous submarine canyons.

Major features of the Continental Shelf surveyed by the Bureau are shown in fig. 5. To the west are a number of well-known halibut fishing grounds such as Albatross Gully, Portlock Bank, and Seward Gully. Between Cape Cleare and Cape St. Elias is a large flat area which forms Middle Bank and the Cape Cleare grounds. Between Cape St. Elias and Dry Bay the Continental Shelf is penetrated by five submarine canyons: Kayak, Tsivat, Icy, Yakutat, and Alsak. East of Yakutat Canyon there are two large flats, Yakutat Bank and the Fairweather Grounds, which are major halibut fishing grounds.

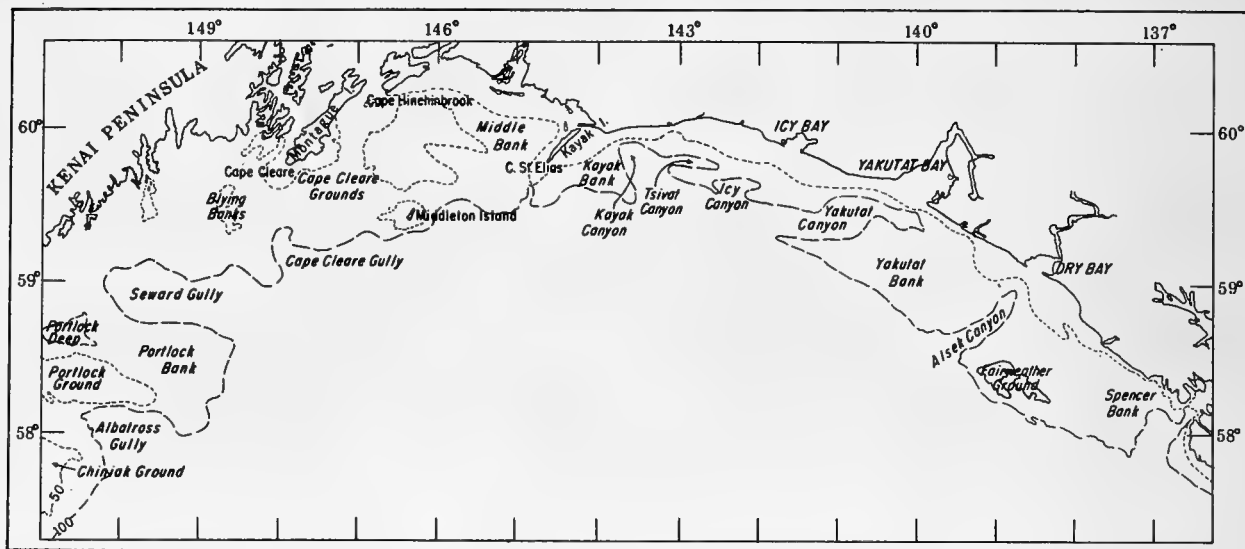


Fig. 5 - Major features of the Continental Shelf and slope surveyed by the U. S. Bureau of Commercial Fisheries in the Gulf of Alaska.

## RESULTS

**LIMITATIONS OF THE DATA:** Major limitations of the surveys are those imposed by (1) the selectivity of the otter trawls used and (2) the seasonal movements of certain species. Otter trawls of the type used in the surveys can be fished only on relatively smooth bottom free of rocks and other obstructions. Moreover, all trawls are selective toward certain species of fish and certain size groups within each species. The work of Soviet investigators (Lyubimova 1962, 1963) in the Gulf of Alaska clearly illustrates this selectivity in trawls. She found that ocean perch were very mobile and as a rule 6 to 9 feet off the bottom, hence a light trawl fished just off the bottom was effective in harvesting this species. On May 5, 1962, the personnel aboard the *John N. Cobb* had an opportunity to observe the Soviet gear in operation (Pruter 1962). The catches appeared to consist entirely of Pacific ocean perch. Many species of bottomfish inhabiting the survey area probably perform seasonal onshore-offshore migrations as well as movements along the coast. Thus, their availability to capture may have been different if the surveys had taken place at other times of the year. These factors undoubtedly influenced the results described here.

**SAMPLING EFFORT:** The Bureau's survey area had 617 stations. Of that total, 210 stations were considered successful, while 304 were considered unsuccessful, and 103 were not occupied (fig. 6).

Successful stations are defined as those where the net was trawled for 1 hour with no resultant net damage; the unsuccessful stations are those where the net was trawled less than an hour, where the net was damaged, or where echo-soundings indicated untrawlable grounds; unoccupied stations were either missed because of time limitations or because the bottom topography shown on navigations charts indicated they were not suitable for trawling. Approximately 50 percent of the stations were found to be untrawlable to the conventional otter trawl.

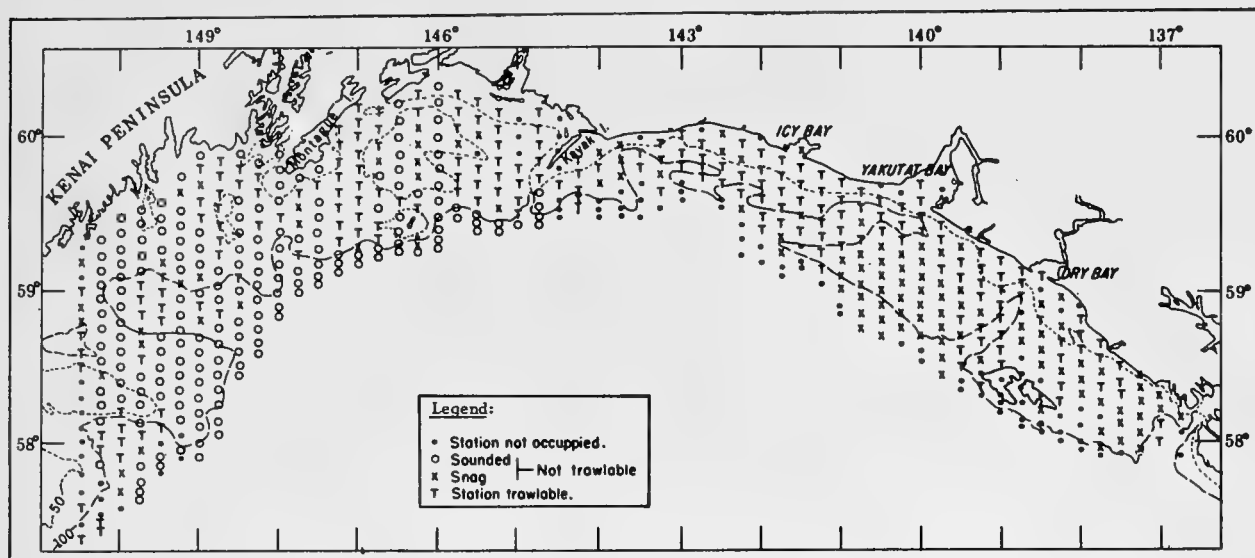


Fig. 6 - Survey area in Gulf of Alaska had 617 stations. Shows distribution of trawlable, not trawlable, and unoccupied stations.

Trawling at depths less than 51 fathoms was restricted because of much hard and uneven bottom. About 80 percent of the successful sampling occurred within the depth range of 51-150 fathoms (table 1). Only 3 percent of the total samples was made in the greatest depths sampled (201-250 fathoms), primarily because the continental slope was steep.

**ANALYSIS OF CATCHES:** Catches from the successful stations are shown in table 2 by major groups and by depth intervals. The catches of individual groups per unit of trawling effort are shown in table 3. Catches of all species combined in individual hauls ranged from 40 to 7,000 pounds and averaged 1,272 pounds per hour trawled (fig. 7). The most productive area was between Icy Bay and Dry Bay.

Table 1 - Distribution of Sampling Effort for Successful Hauls by Depth Interval

Depth Interval	Hours Fished	Percentage of Effort
<u>Fathoms</u>		<u>%</u>
0-50 . . . . .	27.11	12.4
51-100 . . . . .	104.91	48.0
101-150 . . . . .	69.35	31.7
151-200 . . . . .	11.03	5.0
201-250 . . . . .	6.06	2.8
Total . . . . .	218.48	99.9

Table 2 - Total Indicated Species Groups Caught by Depth Intervals

Depth Interval	Flatfish	Invertebrates	Roundfish	Rockfish	Elasmobranchs	Other Species	Total
<u>Fathoms</u>							
1-50	16,307	3,670	8,664	13	603	124	29,381
51-100	56,053	26,812	19,137	6,583	4,258	535	113,378
101-150	36,022	29,655	9,979	18,837	2,633	482	97,608
151-200	7,784	13,183	546	2,010	197	58	23,778
201-250	4,547	1,864	2,598	2,489	122	2,185	13,805
Total	120,713	75,184	40,924	29,932	7,813	3,384	277,950
Percentage	43.4	27.0	14.7	10.8	2.8	1.2	99.9

Table 3 - Indicated Species Groups Caught Per Hour Trawled

Depth Interval	Flatfish	Invertebrates	Roundfish	Rockfish	Elasmobranchs	Other Species	Total
<u>Fathoms</u>							
1-50	601.5	135.4	319.6	.5	22.2	4.6	1,083.8
51-100	534.3	255.6	182.4	62.8	40.6	5.1	1,080.7
101-150	519.4	427.6	143.9	271.6	38.0	7.0	1,644.6
151-200	705.7	1,195.2	49.5	182.2	17.9	5.3	2,155.8
201-250	750.3	307.6	428.7	410.7	20.1	360.6	2,278.0
Average	552.5	344.1	187.3	137.0	35.8	15.5	1,272.2

Of the six major groups, flatfish was first in total relative abundance; invertebrates, second; roundfish, third; rockfish, fourth; and elasmobranchs, fifth. The sixth group consisted of miscellaneous fish species that were not included in the other groups.

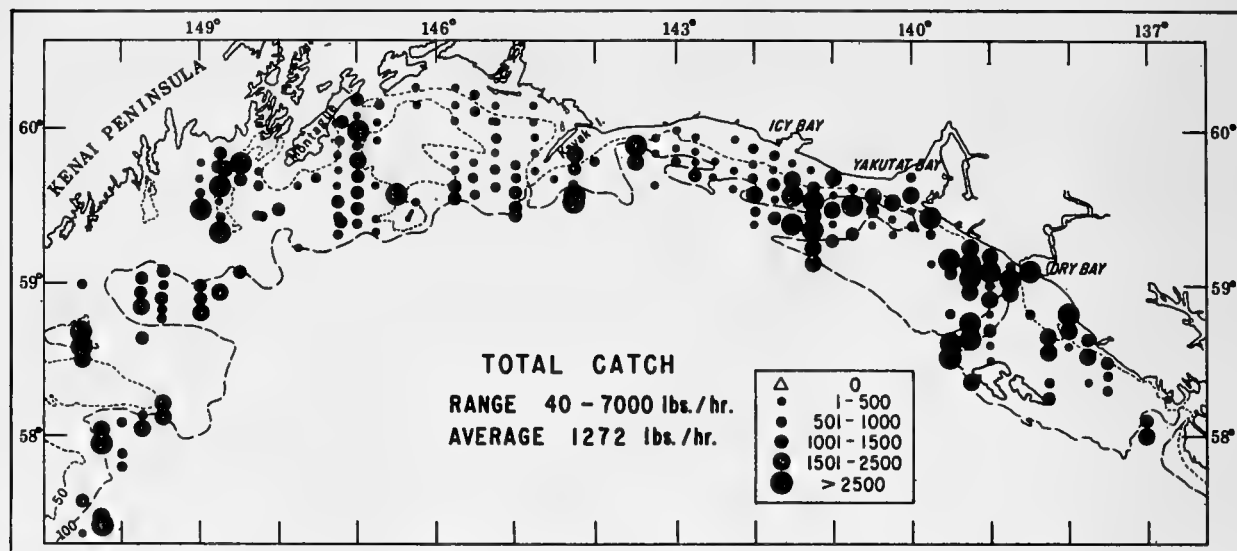


Fig. 7 - Quantity of all species caught per hour trawled.

**Flatfish:** The flatfish group which comprised 43 percent of the total catch numbered more species than any of the other 4 major fish groups. Species caught were: arrowtooth flounder or turbot, *Atheresthes stomias*; flathead sole, *Hippoglossoides elassodon*; Dover sole, *Microstomus pacificus*; Pacific halibut, *Hippoglossus stenolepis*; butter sole, *Isopsetta isolepis*; rex sole, *Glyptocephalus zachirus*; starry flounder, *Platichthys stellatus*; English sole, *Parophrys vetulus*; rock sole, *Lepidopsetta bilineata*; petrale sole, *Eopsetta jordani*; and sand sole, *Psettichthys melanostictus*.

Table 4 - Total Individual Species of Flatfish Taken by Depth Intervals

Depth Interval	Turbot	Flathead Sole	Dover Sole	Halibut	Butter Sole	Rex Sole	Starry Flounder	English Sole	Rock Sole	Petrale Sole	Sand Sole	Total
<b>Fathoms</b>												
1-50	3,491	672	6	1,652	5,498	274	3,402	1,010	241	7	53	16,307
51-100	38,447	11,029	694	3,575	167	1,106	143	667	213	12	-	56,053
101-150	24,645	5,425	2,398	1,215	-	2,150	-	1	13	175	-	36,022
151-200	4,264	791	1,491	585	-	653	-	-	-	-	-	7,784
201-250	1,325	-	3,025	50	-	147	-	-	-	-	-	4,547
<b>Total</b>	<b>72,172</b>	<b>17,917</b>	<b>7,614</b>	<b>7,077</b>	<b>5,665</b>	<b>4,330</b>	<b>3,545</b>	<b>1,678</b>	<b>467</b>	<b>194</b>	<b>53</b>	<b>120,713</b>
<b>Percentage</b>	<b>59.8</b>	<b>14.8</b>	<b>6.3</b>	<b>5.9</b>	<b>4.7</b>	<b>3.6</b>	<b>2.9</b>	<b>1.4</b>	<b>0.4</b>	<b>0.1</b>	<b>0.0</b>	<b>100.0</b>

Turbot accounted for about 60 percent of the total flatfish (table 4) and 26 percent of the total catch by weight. The average catch rate (all depth intervals) for that species was 330 pounds per hour trawled; that rate was over four times greater than that for flathead sole, the second most abundant species (table 5). The availability of turbot as measured by the catch

Table 5 - Individual Species of Flatfish Caught Per Hour Trawled

Depth Interval	Turbot	Flathead Sole	Dover Sole	Halibut	Butter Sole	Rex Sole	Starry Flounder	English Sole	Rock Sole	Petrale Sole	Sand Sole	Total
<b>Fathoms</b>												
1-50	128.8	24.8	0.2	60.9	202.8	10.1	125.5	37.3	8.9	0.3	2.0	601.5
51-100	366.5	105.1	6.6	34.1	1.6	10.5	1.4	6.4	2.0	0.1	-	534.3
101-150	355.4	78.2	34.6	17.5	-	31.0	-	-	0.2	2.5	-	519.4
151-200	386.6	71.7	135.2	53.0	-	59.2	-	-	-	-	-	705.7
201-250	218.6	-	499.2	8.3	-	24.3	-	-	-	-	-	750.3
<b>Average</b>	<b>330.3</b>	<b>82.0</b>	<b>34.9</b>	<b>32.4</b>	<b>25.9</b>	<b>19.8</b>	<b>16.2</b>	<b>7.7</b>	<b>2.1</b>	<b>0.9</b>	<b>0.2</b>	<b>552.5</b>

per hour trawled was relatively high and fairly constant at all depths (table 5); however, that flounder was not the dominant species in all depth intervals (table 14). Turbot catches in individual 1-hour trawls ranged from 0 to 4,500 pounds, with largest catches near Dry Bay (fig. 8).

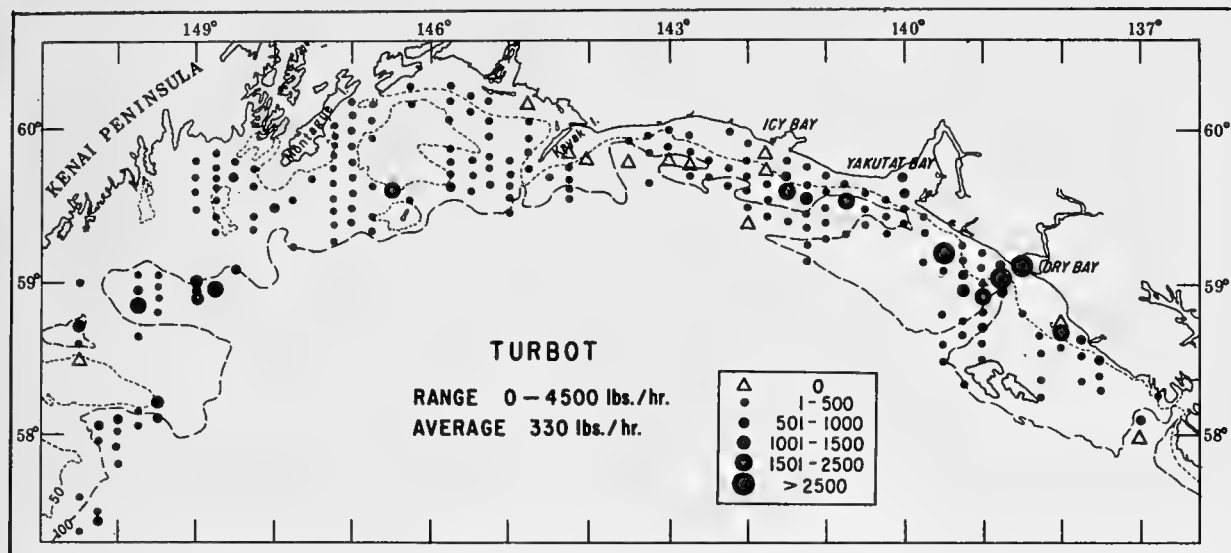


Fig. 8 - Pounds of turbot caught per hour trawled.

Flathead sole ranked second to turbot in the flatfish catches and accounted for about 15 percent of the total flatfish caught (table 4). The catch rate of flathead sole was highest in the 51- to 100-fathom interval (tables 5 and 14). Most of the successful trawls west of Kayak Island contained flathead sole, but to the east many did not. The largest catches of up to 2,250 pounds per hour trawled were between Yakutat Bay and Dry Bay (fig. 9).

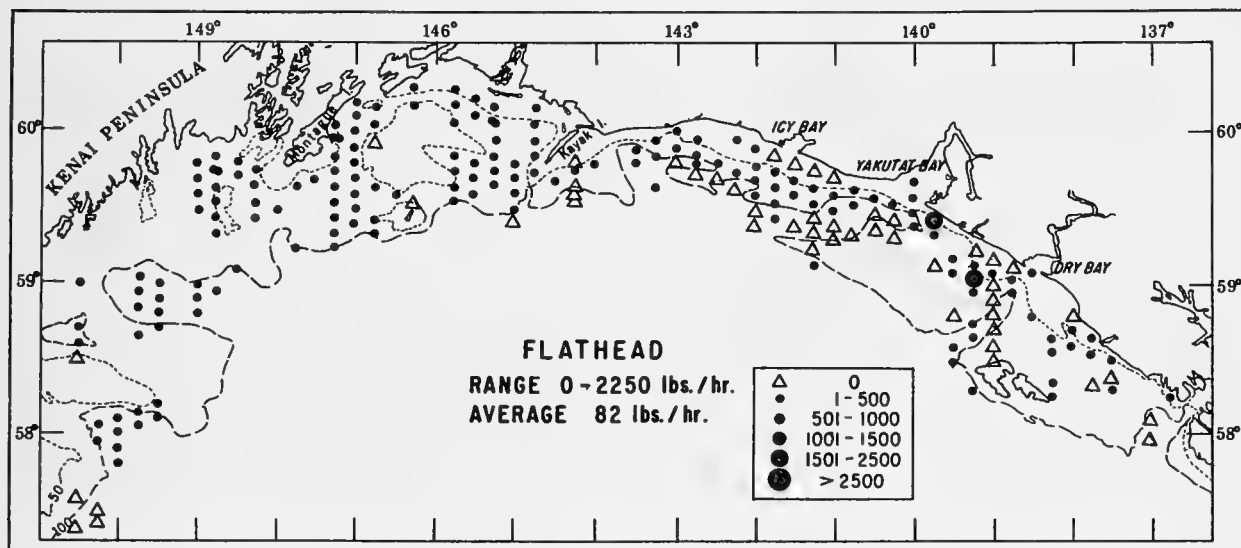


Fig. 9 - Pounds of flathead sole caught per hour trawled.

Dover sole dominated the flatfish catches in the 201-250 fathom interval (tables 4 and 5) and the catch rates in that depth interval were higher than for any other fish species (table 14). Although about 50 percent of the hauls did not contain Dover sole, two 1-hour hauls south of Albatross Gully yielded the largest Dover sole catches--1,000 and 2,000 pounds (fig. 10). Total lengths of Dover sole ranged from 9 to 25 inches and averaged 13.4 inches.

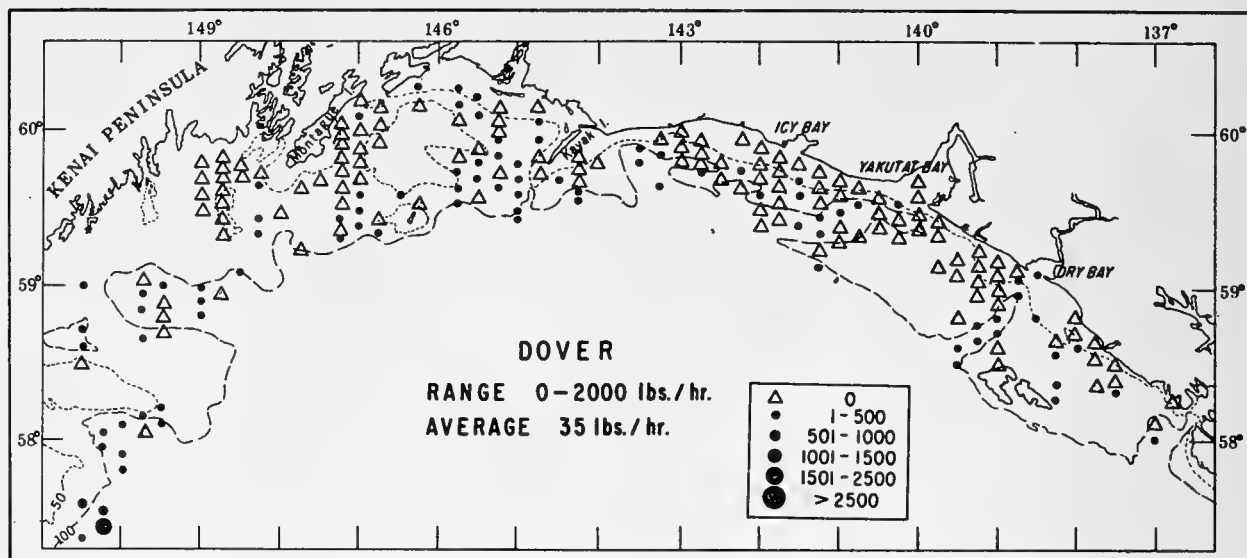


Fig. 10 - Pounds of Dover sole caught per hour trawled.

Butter sole and starry flounder were most abundant in the 1-50 fathom depth intervals where their respective average catch rates were 202 and 125 pounds per hour trawled (tables 5 and 14). In three drags just outside Dry Bay over 1,000 pounds of butter sole were caught per hour trawled. A catch of 1,000 pounds of starry flounders was taken outside of Yakutat Bay.

The remaining six species of flatfish (halibut, rex sole, English sole, rock sole, petrale sole, and sand sole) comprised 11 percent of the total pounds of that species group (table 4). English sole, rock sole, and sand sole were commonly found in the shallower waters (table 5). Halibut and rex sole were found at all depths surveyed (table 5). The highest catch rates for rex sole occurred in the 151-200 fathom depth interval and for halibut in the 1- to 50-fathom interval (table 5). The relative availability of halibut to trawls used in these surveys was fairly uniform throughout the region investigated (fig. 11). The largest catch of halibut was 360 pounds taken in a 1-hour haul off Middleton Island. Total lengths of halibut ranged from 9 to 69 inches and averaged 23.6 inches.

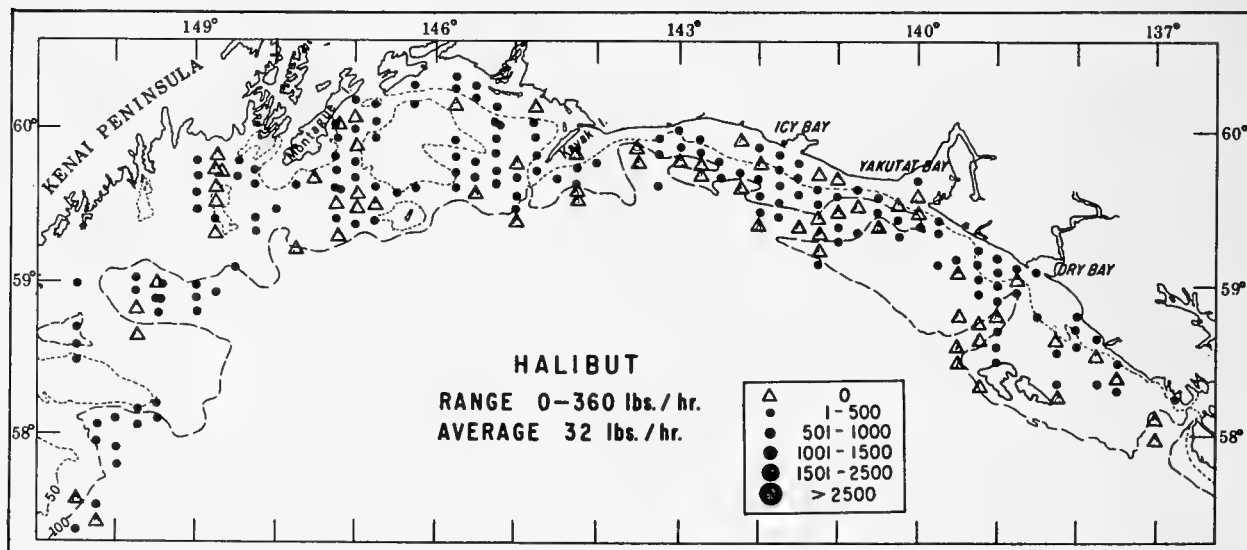


Fig. 11 - Pounds of halibut caught per hour trawled.



**Roundfish:** The roundfish group (exclusive of rockfish) which comprised 15 percent of the total catch was made up of four species; true cod (*Gadus macrocephalus*), Alaska pollock (*Theragra chalcogrammus*), sablefish (*Anoplopoma fimbria*), and lingcod (*Ophiodon elongatus*).

True cod accounted for about 40 percent of the total roundfish captured (table 6). The availability of true cod was highest in the 1- to 50-fathom interval (table 7) and also higher than any other species caught in that interval (table 14). Catches of true cod were scattered throughout the survey area (fig. 12). The largest catches were taken on Yakutat Flats (1,000 and 6,000 pounds in two 1-hour hauls) and near Blying Banks southwest of Cape Cleare (4,500 pounds in a 1-hour haul). Total lengths of true cod ranged from 11 to 30 inches and averaged 18 inches.

Table 6 - Total Individual Species of Roundfish Taken by Depth Intervals					
Depth Interval	True Cod	Pollock	Sablefish	Lingcod	Total
Fathoms	(Pounds)				
1-50	8,030	262	364	8	8,664
51-100	7,732	8,816	2,544	45	19,137
101-150	801	6,283	2,889	6	9,979
151-200	8	327	211	-	546
201-250	2	-	2,596	-	2,598
Total	16,573	15,688	8,604	59	40,924
Percentage	40.5	38.3	21.0	0.1	99.9

Table 7 - Individual Species of Roundfish Caught Per Hour Trawled					
Depth Interval	True Cod	Pollock	Sablefish	Lingcod	Total
Fathoms	(Pounds)				
1-50	296.2	9.7	13.4	0.3	319.6
51-100	73.7	84.0	24.2	0.4	182.4
101-150	11.6	90.6	41.7	0.1	143.9
151-200	0.7	29.7	19.1	-	49.5
201-250	0.3	-	428.4	-	428.7
Average	75.9	71.8	39.4	0.3	187.3

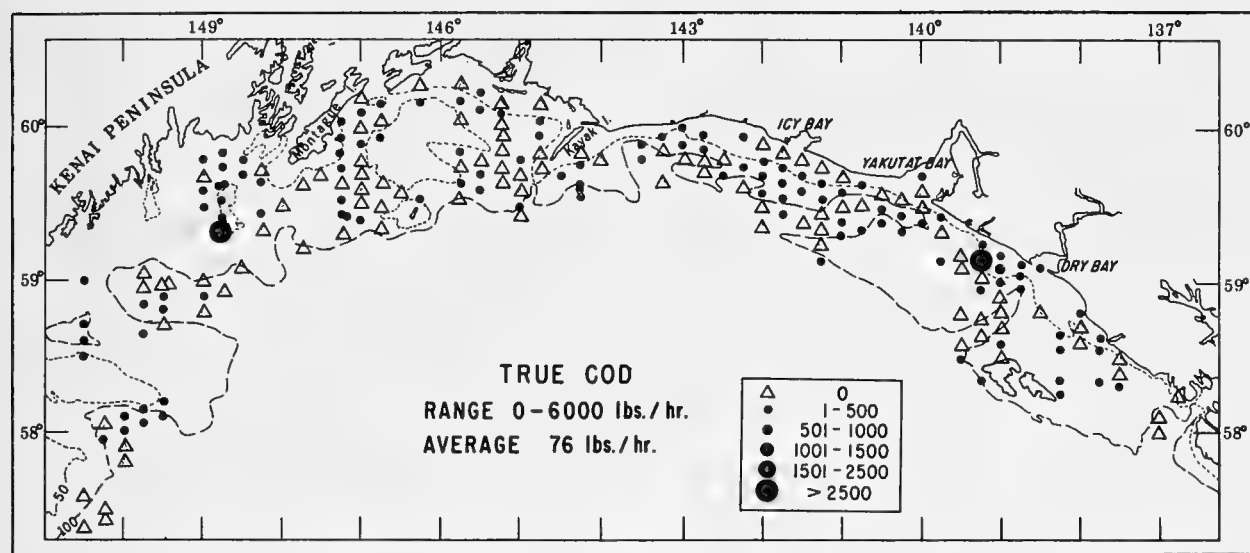


Fig. 12 - Pounds of true cod caught per hour trawled.

The Alaska pollock was most available in the depth range of 51-150 fathoms (tables 7 and 14). About 50 percent of the hauls east and 83 percent of the hauls west of Cape Hinchinbrook contained Alaska pollock (fig. 13). Several catches of over 1,000 pounds per hour trawled were taken west of Cape Hinchinbrook.

The catch rate of sablefish in the 201- to 250-fathom interval was 10 times as high as that obtained in any shallower interval (table 7) and was higher than that for any other species except Dover sole in this deepest interval surveyed (table 14). About 76 percent of the hauls made during the survey contained sablefish. The two largest catches of 1,500 and 2,000 pounds of sablefish per hour trawled of sablefish were taken off Cape Spencer and near the Fairweather Grounds (fig. 14).

**Rockfish:** For convenience rockfish are divided into four groups: Pacific ocean perch (*Sebastes alutus*), idiots (*Sebastolobus* sp.), rougheye rockfish (*Sebastes aleutianus*), and

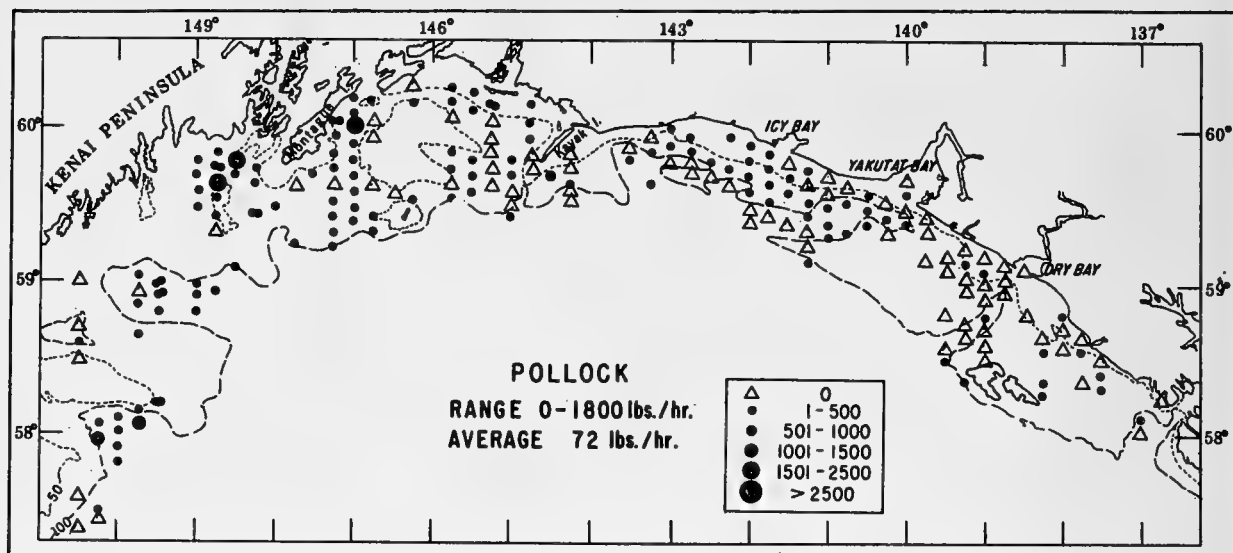


Fig. 13 - Pounds of pollock caught per hour trawled.

other rockfish (*Sebastes brevispinis*, *S. melanops*, *S. flavidus*, *S. saxicola*, *S. crameri*, *S. rubrivinctus*, and *S. halvomaculatus*). This group made up 11 percent of the total catch.

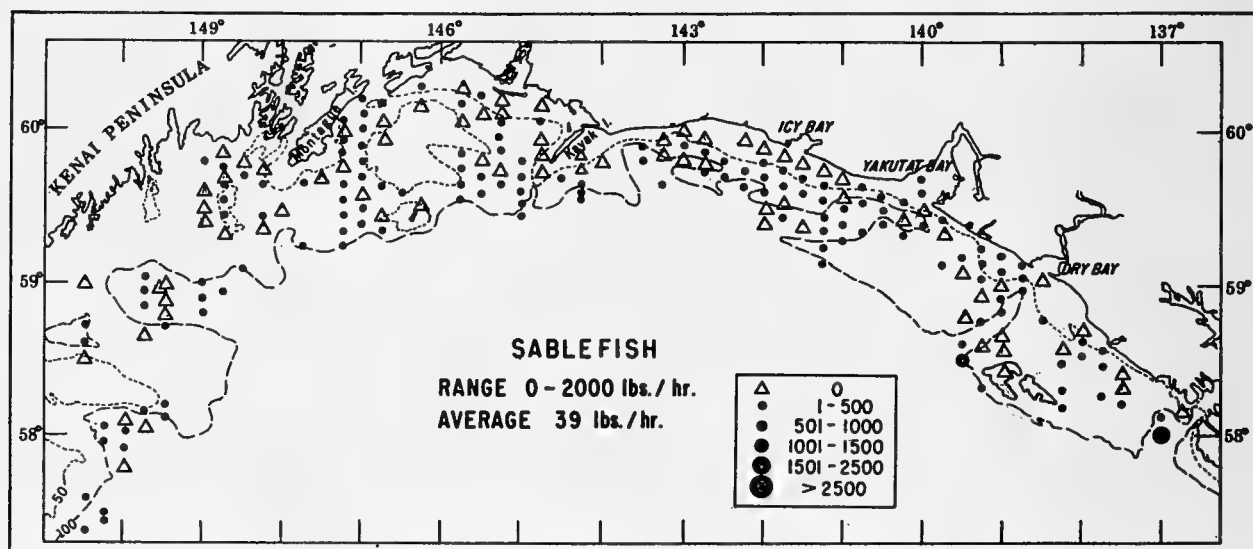


Fig. 14 - Pounds of sablefish caught per hour trawled.

Pacific ocean perch represented 74 percent of the total rockfish catch (table 8). Catch rates of that species were highest in the 101- to 200-fathom depth range (tables 9 and 14). About 63 percent of the hauls made during the survey contained Pacific ocean perch, with the large catches of over 1,000 pounds occurring near the 100-fathom contour (fig. 15).

The remaining three groups of rockfish accounted for 26 percent of the total rockfish catch (table 8). Catch rates of both *Sebastes* and the rougheye rockfish generally increased with depth (table 9). The indicated relative abundance of rougheye rockfish was highest (336 pounds per hour trawled) in the 201- to 250-fathom interval (tables 9 and 14).

Table 8 - Total Individual Species or Groups of Rockfish Taken by Depth Interval

Depth Interval	Pacific Ocean Perch	Sebastolobus	Rougheye	Others	Total
Fathoms	(Pounds)				
1-50	2	-	1	10	13
51-100	6,059	243	182	99	6,583
101-150	14,185	3,817	616	219	18,837
151-200	1,748	253	5	4	2,010
201-250	-	451	2,034	4	2,489
Total	21,994	4,764	2,838	336	29,932
Percentage	73.5	15.9	9.5	1.1	100.0

Table 9 - Individual Species or Groups of Rockfish Caught Per Hour Trawled

Depth Interval	Pacific Ocean Perch	Sebastolobus	Rougheye	Others	Total
Fathoms	(Pounds)				
1-50	0.1	-	0.0	0.4	0.5
51-100	57.8	2.3	1.7	0.9	62.8
101-150	204.5	55.0	8.9	3.2	271.6
151-200	158.5	22.9	0.5	0.4	182.2
201-250	-	74.4	335.6	0.7	410.7
Average	100.7	21.8	13.0	1.5	137.0

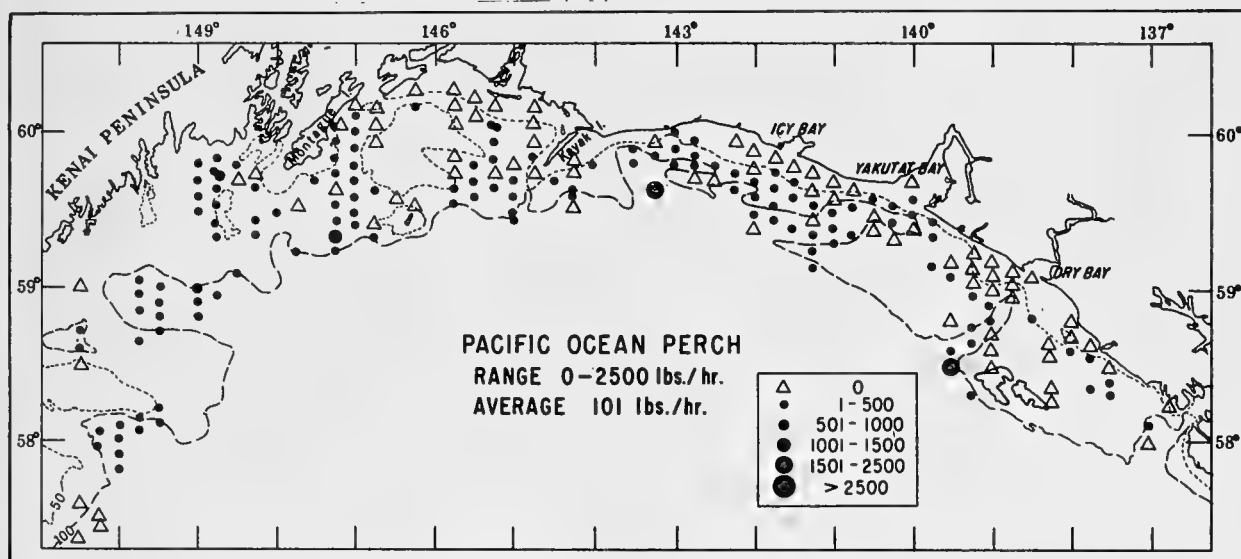


Fig. 15 - Pounds of Pacific ocean perch caught per hour trawled.

**Elasmobranchs:** Dogfish (*Squalus acanthias*) and skate (*Raja* sp.) comprised the elasmobranch group, with skates dominating the catches (table 10). This group accounted for 3 percent of the total catch. The availability of both the skate and dogfish was low in all depth intervals compared to that of other species (table 14).

Table 10 - Total Skate and Dogfish Taken by Depth Interval

Depth Interval	Skates	Dogfish	Total
Fathoms	(Pounds)		
1-50	362	241	603
51-100	3,274	984	4,258
101-150	2,506	127	2,633
151-200	197	-	197
201-250	122	-	122
Total	6,461	1,352	7,813
Percentage	82.7	17.3	100.0

Table 11 - Skate and Dogfish Caught Per Hour Trawled

Depth Interval	Skates	Dogfish	Total
Fathoms	(Pounds)		
1-50	13.4	8.9	22.2
51-100	31.2	9.4	40.6
101-150	36.1	1.8	38.0
151-200	17.9	-	17.9
201-250	20.1	-	20.1
Average	29.6	6.2	35.8

**Other Fish Species:** This group consists of many different families including herring (Clupeidae), sculpin (Cottidae), poacher (Agonidae), ronquil (Bathymasteridae), eelpout (Zoarcidae), and rattail (Coryphaenoididae). This group accounted for only one percent of the total catch. Most of the catches in this group were insignificant except in the 201- to 250-fathom interval where a value of 360 pounds per hour trawled was attained (table 3), over 99 percent of which consisted of rattail. This rate was higher than that of any other single species taken at that depth, except Dover sole and sablefish (table 14). Total lengths of the rattail ranged from 29 to 38 inches and averaged 23.9 inches in total length.

**Invertebrates:** Invertebrates comprising 27 percent of the total catch were grouped into eight categories; heart urchins (*Echinoidea*), tanner crab (*Chionoecetes opilio*), starfish (*Astroidea*), Dungeness crab (*Cancer magister*), scallop (*Pecten caurinus*), shrimp (*Pandalus borealis*, *P. platyceros*, and *Pandalopsis dispar*), king crab (*Paralithodes camtschatica*), and miscellaneous invertebrates (shells, sponges, etc.)

Table 12 - Total Individual Species or Groups of Invertebrates by Depth Intervals

Depth Interval	Heart Urchins	Tanner Crab	Starfish	Dungeness Crab	Misc. Invert. spp. 1/	Scallops	Shrimp	King Crab	Total
<b>Fathoms</b>	<b>(Pounds)</b>								
1-50	10	125	2,201	1,025	12	286	11	-	3,670
51-100	6,047	8,862	8,224	1,606	1,256	472	191	154	26,812
101-150	17,465	7,333	3,385	10	1,220	2	186	54	29,655
151-200	13,100	57	100	-	8	-	18	-	13,183
201-250	900	50	800	-	114	-	-	-	1,864
<b>Total</b>	<b>37,422</b>	<b>16,427</b>	<b>14,710</b>	<b>2,641</b>	<b>2,610</b>	<b>760</b>	<b>406</b>	<b>208</b>	<b>75,184</b>
<b>Percentage</b>	<b>49.8</b>	<b>21.9</b>	<b>19.6</b>	<b>3.5</b>	<b>3.4</b>	<b>1.0</b>	<b>0.5</b>	<b>0.3</b>	<b>99.99</b>

1/Miscellaneous shells, sponges, etc.

Heart urchins accounted for about 50 percent of the invertebrate catch (table 12). The catch rate in the 151- to 200-fathom depth interval was higher (1,179 pounds per hour trawled) than for other invertebrate or fish species taken in any depth interval (table 14). The heart urchins were primarily found concentrated in the following canyons: Kayak, Yakutat, and Alsek (fig. 16).

Table 13 - Individual Species or Groups of Invertebrates Caught Per Hour Trawled

Depth Interval	Heart Urchins	Tanner Crab	Starfish	Dungeness Crab	Misc. Invert. spp. 1/	Scallops	Shrimp	King Crab	Total
<b>Fathoms</b>	<b>(Pounds)</b>								
1-50	0.4	4.6	81.2	37.8	0.4	10.6	0.4	-	135.4
51-100	57.6	84.5	78.4	15.3	12.0	4.5	1.8	1.5	255.6
101-150	251.8	105.7	48.8	0.1	17.6	0.0	2.7	0.8	427.6
151-200	1,178.6	5.2	9.1	-	0.7	-	1.6	-	1,195.2
201-250	148.5	8.2	132.0	-	18.8	-	-	-	307.6
<b>Average</b>	<b>171.3</b>	<b>75.2</b>	<b>67.3</b>	<b>12.1</b>	<b>12.0</b>	<b>3.5</b>	<b>1.9</b>	<b>1.0</b>	<b>344.1</b>

1/Miscellaneous shells, sponges, etc.

Tanner crab ranked second to heart urchins and represented about 22 percent of the invertebrate catch (table 12). The catch rate of tanner crab was highest in the 101- to 150-

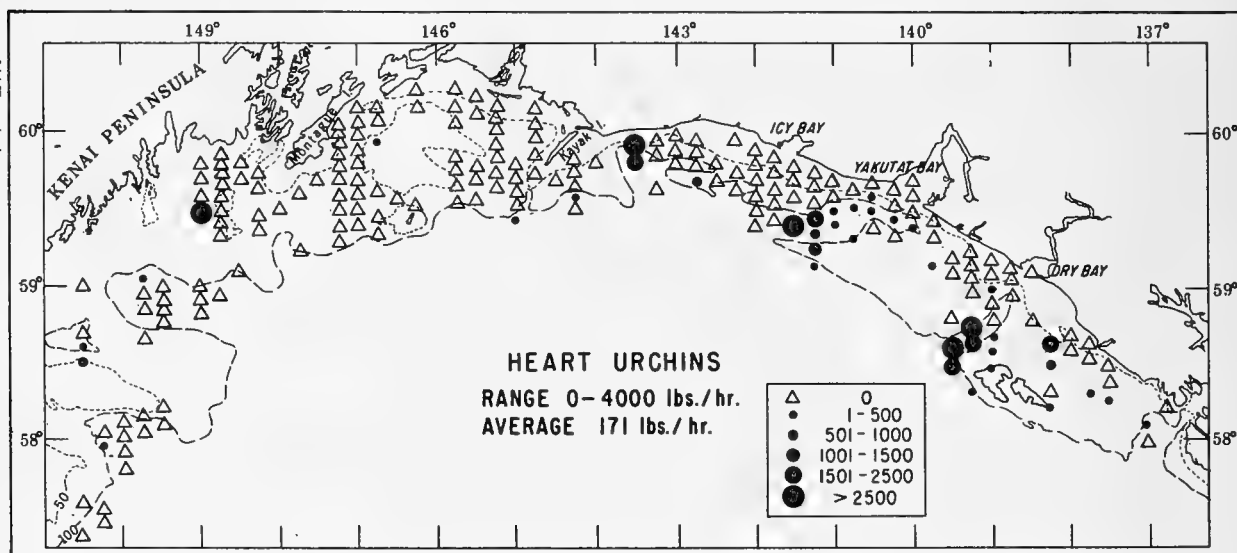


Fig. 16 - Pounds of heart urchins caught per hour trawled.

fathom interval (tables 13 and 14). Eighty-five percent of the catches west and 50 percent of the catches east of Middleton Island had tanner crab. The largest catch of 2,390 pounds per hour trawled occurred northwest of Middleton Island (fig. 17).

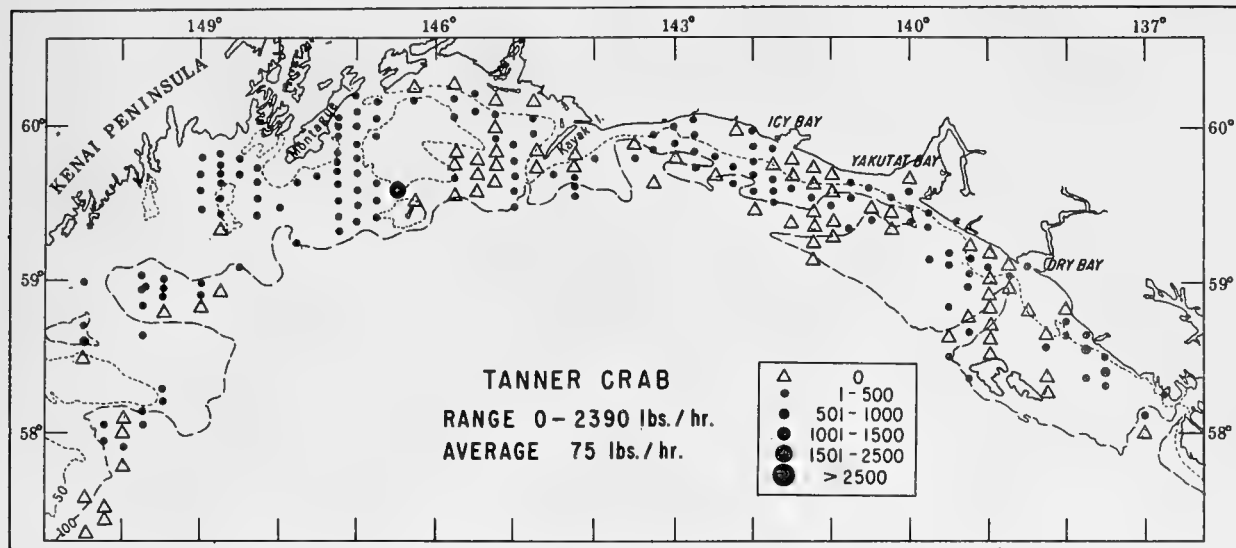


Fig. 17 - Pounds of tanner crab caught per hour trawled.

About 20 percent of the total invertebrate catch was composed of starfish (table 6). The catch rate of 132 pounds per hour in the 201- to 250-fathom interval was higher than that for most other invertebrates and fish species (tables 13 and 14).

Table 14 - Ranking of Individual Species or Species Groups by Catch Per Unit of Effort and Depth  
(Figures in Parenthesis are Pounds Caught Per Hour Trawled)

Depth Interval in Fathoms					
1-50	51-100	101-150	151-200	201-250	All Depths (1-250)
True cod (296)	Turbot (366)	Turbot (355)	Heart urchin (1179)	Dover (499)	Turbot (330)
Butter sole (203)	Flathead (105)	Heart urchins (252)	Turbot (386)	Sablefish (428)	Heart urchins (171)
Turbot (129)	Tanner crab (84)	P.O.P. (204)	P.O.P. (158)	Other fish sp. (361)	P.O.P. (101)
Starry flounder (125)	Pollock (84)	Tanner crab (106)	Dover (135)	Roughye (336)	Flathead (82)
Starfish (81)	Starfish (78)	Pollock (91)	Flathead (72)	Turbot (218)	True cod (76)
Halibut (61)	True cod (74)	Flathead (78)	Rex (59)	Heart urchins (148)	Tanner crab (76)
Dungeness (38)	P.O.P. (58)	Sebastolobus (55)	Halibut (53)	Starfish (132)	Pollock (72)
English (37)	Heart urchins (58)	Starfish (49)	Pollock (30)	Sebastolobus (74)	Starfish (67)
Flathead (25)	Halibut (34)	Sablefish (42)	Sebastolobus (23)	Rex (24)	Sablefish (39)
Sablefish (13)	Skate (31)	Skate (36)	Sablefish (19)	Skate (20)	Dover sole (35)
Skate (13)	Sablefish (24)	Dover (35)	Skate (18)	Misc. inver. (19)	Halibut (32)
Scallop (10)	Dungeness (15)	Rex (31)	Starfish (9)	Halibut (8)	Skate (29)
Rex (10)	Misc. inver. (12)	Misc. inver. (18)	Tanner crab (5)	Tanner crab (8)	Butter sole (26)
Pollock (10)	Rex (11)	Halibut (17)	Other fish sp. (5)	Other rockfish (1)	Sebastolobus (22)
Rock sole (9)	Dogfish (9)	True cod (12)	Shrimp (2)	True cod (0.3)	Rex sole (20)
Dogfish (9)	Dover (7)	Roughye (9)	Misc. inver. (1)	Dogfish (0)	Starry flounder (16)
Tanner crab (5)	English (6)	Other fish sp. (5)	True cod (1)	P.O.P. (0)	Other fish sp. (5)
Other fish sp. (5)	Other fish sp. (5)	Other rockfish (3)	Roughye (0.5)	Lingcod (0)	Roughye (13)
Misc. inver. (0.4)	Scallop (4)	Shrimp (3)	Other rockfish (0.1)	Pollock (0)	Dungeness (12)
Shrimp (0.4)	Sebastolobus (2)	King crab (3)	Rock sole (0)	Shrimp (0)	Misc. inver. (12)
Heart urchins (0.4)	Rock sole (2)	Petrale (2)	Petrale (0)	King crab (0)	English sole (8)
Other rockfish (0.4)	Shrimp (2)	Dogfish (2)	English (0)	Dungeness (0)	Dogfish (6)
Lingcod (0.3)	Roughye (2)	Rock sole (0.2)	Butter sole (0)	Scallop (0)	Scallop (3)
Petrale (0.3)	Butter sole (2)	Dungeness (0.1)	Starry flounder (0)	Rock sole (0)	Rock sole (2)
Sand sole (0.2)	King crab (1)	Lingcod (0.1)	Sand sole (0)	Petrale (0)	Shrimp (2)
Dover (0.2)	Starry flounder (1)	Scallop (0)	King crab (0)	Flathead (0)	Other rockfish (2)
P.O.P. (0.1)	Other rockfish (1)	English (0)	Dungeness (0)	English (0)	King crab (1)
Roughye (0.1)	Lingcod (0.4)	Butter sole (0)	Scallop (0)	Butter sole (0)	Petrale (1)
King crab (0)	Petrale (0.1)	Starry flounder (0)	Lingcod (0)	Starry flounder (0)	Lingcod (0.3)
Sebastolobus (0)	Sand sole (0)	Sand sole (0)	Dogfish (0)	Sand sole (0)	Sand sole (0.2)

The remainder of the invertebrate catches consisted of Dungeness crab, scallop, shrimp, king crab, and miscellaneous species (table 12). Dungeness crab and scallop were primarily

found in shallow water (table 13). Catches of both those species were small with the exception of a 1,000-pound haul of scallop taken just east of Cape St. Elias.

### SUMMARY

1. Much of the area surveyed in the Gulf of Alaska was judged untrawlable to the conventional bottom trawls used in the described surveys.
2. Most of the exploratory trawling was done between 51 and 150 fathoms. Trawling at depths less than 51 fathoms was restricted because of much hard and uneven bottom while trawling beyond 150 fathoms was seldom done because of the steepness of the continental slope.
3. The average catch of all species combined during this study was 1,272 pounds per hour haul.
4. Flatfish made up 43 percent of the total fish and invertebrates caught, and averaged 552 pounds per hour haul.
5. The arrowtooth flounder or turbot was a dominant species at all depths, comprising 60 percent of the flatfish catch and 26 percent of the total catch by weight. The average catch rate of the arrowtooth flounder taken for all depth intervals combined was 330 pounds per hour trawled.
6. The ranking of the top four species (highest catch rates) in each of the depth intervals was: 0-50 fathoms--true cod, Bellingham sole, turbot, and starry flounder; 51-100 fathoms--turbot, flathead sole, tanner crab and pollock; 101-150--turbot, heart urchins, Pacific ocean perch, and tanner crab; 151-200 fathoms--heart urchins, turbot, Pacific ocean perch, and Dover sole; 201-250--Dover sole, sablefish, rougheye rockfish, and miscellaneous species.

### FISHING LOG

A detailed fishing log showing the fishing positions, time on bottom, catch particulars, and other pertinent data for each drag is available by writing the Seattle office<sup>1</sup> for the John N. Cobb's Cruise Nos. 52 and 54 and the Juneau office<sup>2</sup> for the Tordenskjold Cruise No. 2.

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## ARE TURTLES NAVIGATION EXPERTS?

How can green sea turtles find their way across more than 1,000 miles of open sea to tiny Ascension Island in the South Atlantic? That is one of the intriguing questions posed by the theory that Brazilian green sea turtles travel to Ascension Island to nest. A tagging project that may throw more light on the mystery was discussed by a University of Florida herpetologist in *Bioscience*, Vol. 14, No. 8.

In 1960 on Ascension Island beaches, a total of 206 turtles were tagged before they returned to the sea. (Turtles completely disappear from Ascension waters by June of each year.) By 1964, eight of the tagged turtles had been recovered along the coast of Brazil. The recoveries came from both north and south of the Brazilian Bulge, at sites located "downstream" from both the Equatorial and the Brazilian ocean currents. (No returns came from the West African coast east of Ascension Island.)

Meanwhile, observers on Ascension Island checked nesting turtles for tag returns. Green sea turtles reproduce in accordance with two different rhythms. About 70 percent follow the major 3-year reproductive rhythm, and the remaining 30 percent reproduce on the minor 2-year rhythm. Possible recovery on Ascension beaches of the 1960-tagged turtles was first tested by means of a tag-check patrol at three beaches in 1963 to catch survivors of the major rhythm group. Three tags were recovered at the identical beaches where the turtles were tagged. In 1964, a similar check was made for possible survivors of the minor rhythm group, making their second round trip since tagging 4 years earlier. As a result, two more tags were recovered at or near the original tagging beach.

These two-way tag returns tend to confirm the theory that green sea turtles found off Brazil nest on Ascension Island. (It is known that the mature female turtles that occur along the Brazilian coast do not nest in Brazil.) The turtles could probably travel from the middle Atlantic to Brazil merely by drifting with ocean currents. But the largest question remains--how after spending 2 or 3 years in Brazil do the turtles find their way back to the 5-mile rock that is Ascension Island through more than 1,000 miles of open sea?

The University of Florida scientist suggests that this remarkable feat may be accomplished by some sort of bi-coordinate navigation. Compass-sense alone would not be enough to keep the turtles on course. The scientist said the solution to this puzzle would depend at least partly upon the precise plotting of actual travel courses of individual turtles. (*SFI Bulletin*, No. 159, February 1965.)

# TRENDS AND DEVELOPMENTS

## Alaska

### SOVIET AND JAPANESE KING CRAB VESSELS VISITED BY U. S. BIOLOGISTS:

Following agreements made with the Soviet Union and Japan late in 1964, United States biologists boarded Soviet and Japanese king crab vessels in the Bering Sea in June 1965 as observers. Two American biologists were on the Soviet factoryship Aleksandr Obukhov for two weeks until June 30. Another American biologist observer was aboard the Japanese factoryship Tainichi Maru. Tanner crabs were being processed on the Soviet vessel. All parts of the crabs were kept, with the inedible parts saved for poultry food.

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### FOREIGN FISHING ACTIVITY OFF ALASKA, JUNE 1965:

U.S.S.R.: The Gulf of Alaska continued to be the center of Soviet trawling efforts during June. In the eastern Gulf from Cape St. Elias to Dixon Entrance, the size of the fleets declined from about 40 vessels in early June to about 10 by month's end. A small contingent of 1 reefer and 3 trawlers broke away from the Gulf of Alaska fleets about the first of June and spent several weeks off the Washington-British Columbia coasts. Catches of ocean perch from the more southern waters were apparently not too productive as that small fleet returned to the area off southeast Alaska in late June.



Fig. 1 - Soviet factoryship in Bering Sea.

A slight reduction in the size of the trawling fleets in the central Gulf became evident by the end of June presumably indicating the transfer of vessels to the herring and saury fisheries off the Soviet coasts, which began about late June in previous years. Portlock Bank east of Kodiak was the area most intensely fished by the Soviets, supporting over 100 vessels early in June and declining to about 70 at month's end. Larger numbers of trawlers began operating on Portlock Bank southwest of Kodiak about mid-month and totaled over 30 vessels by the end of June.



Fig. 2 - New Soviet-type trawler (SRT-M) in foreground fishing for shrimp in Bering Sea. Japanese vessel in background.

In early June a Soviet fleet began building near Seguam Pass in the central Aleutians, which quickly developed into a major fishing effort. The fleet was composed of about 25 trawlers, including at least 12 BMRT factory trawlers, a few reefers, and various support vessels.

Another fleet of about 10 to 15 trawlers, including several factory trawlers, ranged along the western Aleutians throughout June.

Except for the brief time the Soviet factoryship Konstantin Subhanov spent in the western Gulf of Alaska, the 3 king crab fleets remained throughout June in the outer Bristol Bay "flats" northwest of Port Moller.

There were no new sightings in June of the Soviet trawlers previously engaged in the shrimp fishery, but it was believed at least 4 SRT-M type trawlers were shrimp fishing east of the Shumagin Islands.

In June, apparently only one Soviet whaling fleet was active in the Alaskan area. That was the Aleut fleet which was believed to have been active primarily in the western Aleutians.

Japan: The factoryship Chichibu Maru and her 12 trawlers continued during June to fish for ocean perch and flatfish in the central and western Aleutians.

The 4 Japanese factory trawlers and 4 smaller side trawlers which were operating in the western Aleutians were not seen in June and had presumably left the Alaska area. Two other factory trawlers were believed working generally along the 100-fathom curve between the eastern Aleutians and the Pribilof Islands.

The Japanese announced on June 1 that 11 trawling fleets made up of 9 factory trawlers and 14 smaller side trawlers were to be licensed to operate in the Gulf of Alaska this year (1965). This is nearly 4 times the trawling effort the Japanese placed in the Gulf in 1964. By the end of June, 2 of the factory trawlers and a side trawler were working south of Unalaska Island west of Unimak Pass, and in the Gulf of Alaska 2 factory trawlers and 4 side trawlers were active on Albatross Bank south of Kodiak Island.



Fig. 3 - Repairing crab baskets aboard a Japanese crab factoryship.

About mid-June the 3 Japanese fish meal and oil fleets totaling 65 trawlers were no longer operating on the edge of Bristol Bay shelf northeast of Unimak Pass. Those fleets may have followed the pattern of past years and shifted their operational areas to the area northwest of the Pribilof Islands.

The Japanese factoryship Einen Maru and her 15 trawlers continued to operate 40 to 100 miles north of the Pribilof Islands throughout the month in the shrimp fishery.



Fig. 4 - Trawler fishing for Japanese crab factoryship Tokei Maru.

In late May 1965 the Tokei Maru fleet shifted from the accustomed crab grounds off Port Moller to just east of the Pribilof Islands--an area not previously fished intensively by the Japanese king crab fleets. Japanese personnel of that fleet said that the presence of Soviet crab fleets near Port Moller was a significant factor in their decision to move to the Pribilof region. The Tokei Maru fleet operated just east of the Pribilofs throughout June.



Fig. 5 - Hoisting gear in bow of Japanese trawler fishing for factoryship.

The second king crab fleet of the Tainichi Maru remained in the area off Port Miller most of the month, shifting southwest to near Amak Island in late June.

The small Japanese long-line fishing fleet operating in the western Aleutians during May apparently left the Alaska area by early June. Japanese long-line fishing efforts off Alaska had been negligible so far this year, and as far as is known they have not had a long-line fishery for halibut off Alaska in 1965.

Japanese salmon fleets moved just west of the International North Pacific Fisheries Convention (INPFC) salmon abstention line the first days of June but by mid-June after one of their gill-netters was apprehended in violation they had withdrawn to the westward. Intensified United States surveillance patrols in the central Aleutians were terminated on June 18. By that time, the bulk of the maturing Bristol Bay-destined salmon were believed east of the critical corridor between  $175^{\circ}$  W. to  $175^{\circ}$  E. and  $52^{\circ}$  N. to  $55^{\circ}$  N. The Japanese fleets did not reappear in the corridor during June.

This year the Japanese again sent three whaling fleets to the area off Alaska. A fleet composed of 1 factoryship and 7 whale killers began whaling in the central Aleutians about mid-June and remained in that area for the rest of the month. The other 2 fleets of identical vessel composition were not seen during June but at least one of them was believed working in the Gulf of Alaska.

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#### NEW FISHING INDUSTRY FOR UNALAKLEET:

A \$42,000 loan for the construction of a new fish-processing and storage facility in Unalakleet has been approved by the Small Business Administration.

\* \* \* \* \*

#### 1965 HARVEST KELP AND HERRING ROE:

The southeastern Alaska herring roe industry harvested 467,000 pounds of roe-laden kelp during the 1965 season, a 27-percent increase over the 1964 harvest of 369,000 pounds. The harvest was made in the Craig, Hydaberg, and Sitka areas. A total of 765 persons, working mostly from skiffs, used grapples to pull the heavily laden kelp to the surface, where the fronds with the desirable thickness of roe were picked.

In the Craig and Hydaberg areas spawning occurred over an estimated 20 lineal miles

of beach. The relatively small amount of kelp and herring roe being utilized is reflected in the fact that the harvest in that area took place entirely within a 1-mile area. The proportion was the same for the Sitka area.



### Alaska Fisheries Explorations and Gear Development

#### BOTTOMFISH RESOURCES OFF SOUTHEAST ALASKA STUDIED:

M/V "John R. Manning" Cruise 65-1 (April 29-May 15 and May 20-June 7, 1965): To locate trawlable fishing grounds and to delineate commercial concentrations of bottomfish off southeast Alaska was the primary objective of this 6-week cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John R. Manning. Secondary objectives were to: (1) collect data on the seasonal distribution and abundance of the bottomfish resources of Southeastern Alaska, and (2) collect preliminary data on the biological and environmental factors affecting their distribution and abundance.



Fig. 1 - M/V John R. Manning of the U.S. Bureau of Commercial Fisheries.

Echo-sounding transects were made to locate trawlable fishing grounds, and areas which appeared to be reasonably level and of soft consistency were fished with a standard 400-mesh Eastern otter trawl. For the most part, sounding effort was concentrated on the Continental Shelf between Coronation and Noyes Islands. Limited sounding transects were also made in the Gulf of Esquibel.

A total of 32 drags lasting about 1-hour each was made in depths from 32 to 138 fathoms. In the shoal area off Noyes Island, catches of 100-130 pounds of marketable rock sole (Lepidopsetta bilineata) were made

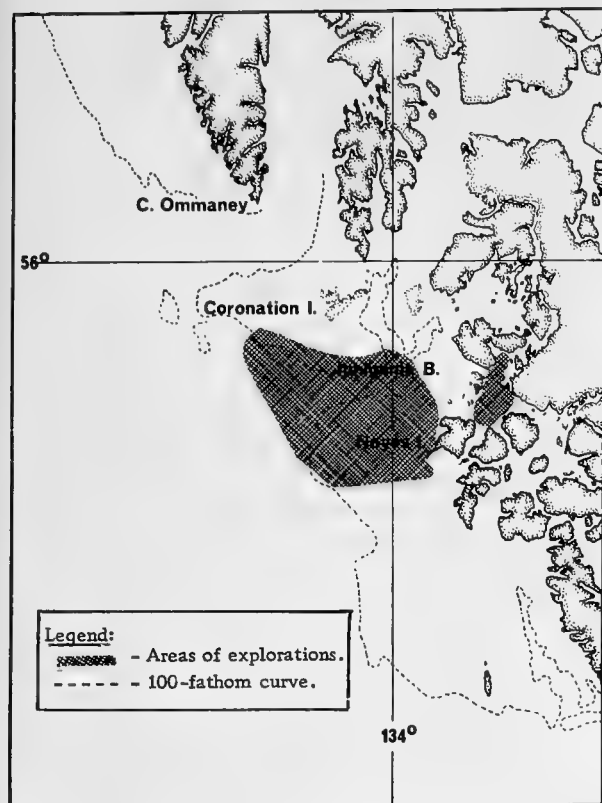


Fig. 2 - M/V John R. Manning bottomfish exploratory cruise 65-1 (April 29-May 15 and May 20-June 7, 1965).

in 4 drags. Those drags ranged in depth from 45 to 64 fathoms. In one of the drags, 1,600 pounds of 100-percent marketable grey cod (*Gadus macrocephalus*) were taken.

In the deeper offshore areas, rockfish accounted for a large percentage of the catch. The largest rockfish catch of the cruise (23,500 pounds) was taken in a drag made in 117 fathoms, 35 miles southwest of Noyes Island. That catch was made up of 20,000 pounds of silver-grey rockfish (*Sebastes brevispinis*), 3,000 pounds of widow rockfish (*Sebastes entomelas*), and 490 pounds of assorted rockfish. In two other drags, 375 pounds of silver-grey rockfish were taken in 102 fathoms and 250 pounds of Pacific ocean perch (*Sebastes alutus*) were taken in 138 fathoms.

The 23,500-pound rockfish catch was delivered to the U. S. Department of Agriculture Experimental Fur Farm, Petersburg, Alaska, for use as mink feed.

Note: See *Commercial Fisheries Review*, August 1965 p. 24.

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## SHRIMP AND BOTTOMFISH RESOURCES OFF SOUTHEAST ALASKA TO BE STUDIED:

M/V "Commando" Cruise 65-2 (July 7-August 25, 1965): To locate trawlable fishing grounds and delineate commercial concentrations of shrimp and bottomfish off southeast Alaska was the principal objective of this cruise by the exploratory fishing vessel *Commando*, chartered by the U. S. Bureau of Commercial Fisheries.

Secondary objectives were to: (1) collect data on the seasonal distribution and abundance of shrimp and bottomfish resources of southeastern Alaska, and (2) collect preliminary data on the ability of the 400-mesh eastern otter trawl to fish on rough bottom when equipped with a roller gear.

Shrimp explorations (from 40 to 110 fathoms) and bottomfish explorations (from 10 to 200 fathoms) were to be conducted on the Continental Shelf and Slope of southeastern Alaska from Dixon Entrance to Cape Ommaney.

Methods of operation during the cruise were to include making echo-sounding transects to locate trawlable fishing grounds. The grounds were then to be sampled with a 40-foot Gulf of Mexico-type shrimp trawl or the 400-mesh Eastern otter trawl.



## Alaska Fisheries Investigations

### KARLUK SALMON

#### MIGRATIONS DELAYED:

Probably due to the recent severe winter, the migrations of Karluk Lake red salmon were late for all stages. This includes movements of fry into Karluk Lake, departure of smolts for the ocean, and arrival of adults from salt water. In southeastern Alaska, the movements and growth of pink and chum fry in salt water have been much different than in 1964, probably due to the cold winter and spring. In the northern part of southeast Alaska the pink juveniles were less abundant and smaller.

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### RECORD NAKNEK RED SALMON SMOLT RUN SHOWS CHANGES IN PATTERN:

Over 23 million smolts went downstream in the Naknek system--the highest migration.

since records were started in 1956. The previous high was in 1962 when 16.5 million were estimated. Extreme windstorms produced unusually turbid water in the Naknek River which caused a reversal of the normal night migration pattern, and this past spring most of the smolts migrated during the daytime. The 1965 smolt migration was about evenly divided between 2 and 3 years of freshwater residence.



## Cans--Shipments for Fishery Products

**January-April 1965:** A total of 898,911 base boxes of steel and aluminum was consumed to make cans shipped to fish and shellfish canning plants in January-April 1965 as compared with 841,363 base boxes used during the same period in 1964.

**January-May 1965:** A total of 1,177,997 base boxes of steel and aluminum was consumed to make cans shipped to fish and shellfish canning plants in January-May 1965 as compared with 1,100,728 base boxes used during the same period in 1964. It is believed that larger shipments to the Pacific or Western Area (principally for salmon and tuna) accounted for the small increase in 1965.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14" x 20" size. Tonnage figures for steel (tinplate) cans are derived by use of the factor 23.7 base boxes per short ton of steel.



## Central Pacific Fisheries Investigations

### SKIPJACK TUNA

#### BIOLOGICAL STUDIES CONTINUED:

**M/V "Charles H. Gilbert" Cruise 82 (May 24-30, 1965):** The area of operations during this cruise by the research vessel Charles H. Gilbert of the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii, was south of Oahu between Kewalo Basin and Browns Camp about 15 miles from shore. Objectives were to: (1) collect and return live mackerel-like species to the Bureau's laboratory behavior tank facilities; (2) collect tuna specimens for density determinations; and (3) determine the weight lost from small, medium, and large skipjack tuna after removal of head and viscera.

A total of 184 skipjack, 3 little tuna, and 2 yellowfin tuna was returned live to the laboratory's Kewalo Basin facility. Of that total, 20 skipjack were taken to Sea Life Park to be used for growth studies and compared with fish being studied at Kewalo Basin.

During the cruise, thermograph and barograph equipment were operated continuously, and the standard watch for fish, birds, and aquatic mammals was maintained. Troll lines were out continuously between Kewalo Basin and each fishing station worked by the vessel. Total trolling time was 9 hours 20 minutes and nothing was caught.

**M/V Charles H. Gilbert Cruise 85:** To collect data which may show whether the skipjack tuna fishery off California and that off Hawaii are drawing on a common resource was the purpose of this 2-month cruise by the research vessel Charles H. Gilbert, which is operated by the U. S. Bureau of Commercial Fisheries. The vessel sailed from Honolulu, Hawaii, July 23, 1965, to begin operations off the west coast of Mexico.

The vessel is to fish for skipjack tuna off the southern coast of Baja California, in the mouth of the Gulf of California, along the Mexican mainland south to Manzanillo, and near the Revillagigedo Islands, 500 miles offshore from Mexico. The area is one in which the California-based tuna fleet makes large skipjack catches.

Object of the cruise is to collect blood and serum samples from skipjack. Samples will be taken off Mexico and from any skipjack that may be encountered in the convergence zone above latitude 10° N., which the vessel will traverse on the way home.

Such blood and serum samples will help provide information on whether the large California fishery and that in Hawaii are drawing on a common resource (that is, whether the skipjack are part of one subpopulation). The California fishery takes about 10 times, by weight, as much skipjack annually as does the Hawaiian fleet.

There already is some evidence that the two fisheries share a common resource, but to what degree is a matter of speculation. The blood and serum samples will be used to distinguish subpopulations of the skipjack. (Subpopulations are groups that are reproductively isolated from other groups of their kind.) Using blood-type techniques developed



for use with humans and domestic animals and adapted for use with tuna, it has been learned that there are several subpopulations of skipjack tuna in the Pacific. Comparison of the subpopulations observed in Hawaiian waters with those sampled in the waters off Mexico should help answer questions about the biological relationship of the two fisheries.

Note: See Commercial Fisheries Review, August 1965 p. 28.

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#### FIRST PHASE OF TRADE WIND ZONE OCEANOGRAPHIC STUDY COMPLETED:

The first phase of an extensive oceanographic project came to an end early in July 1965 when the research vessel Townsend Cromwell returned to her home port of Honolulu, Hawaii, to complete the 16th in a series of cruises undertaken by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu.

The project is a study of the oceanography of the trade wind zone, a region that reaches from longitude 130° W. to 180° E., and from latitude 10° N. to 30° N., covering an area about one and one-third times that of the continental United States.

Working alone, the Townsend Cromwell has been able to investigate only the narrow portion of that region lying north, east, and south of the Hawaiian Islands, an area about twice the size of the State of Texas.

The object of the investigation is to study the seasonal and longer term changes in the distribution of properties in the sea. Those changes are to be examined in terms of the changes in annually repeating processes such as the heat exchange across the sea surface, evaporation minus precipitation, advection, and diffusion. Required for the study are data giving the rate of change as well as the distribution of the properties with time. To find that, sampling has been done at regular, frequent intervals.

The first phase of the investigation is to be followed by a project starting in 1967 in which several vessels will conduct similar investigations over the entire trade wind zone of the North Pacific. The work will last 18 months to 2 years.

The first data from the cruises have been processed and are scheduled to be published as soon as possible. They will be followed up

by a series of descriptive and analytical reports in 1966 and 1967.

In the course of the first phase of the study, the Townsend Cromwell has spent 20 days at sea each month since February 1964, except for August 1964. The vessel has sailed more than 32,000 miles. The pattern for scientific observations during the cruises was established early in the series and did not vary significantly for more than a year. The unchanging routine, in fact, is the heart of the study, since the object is to document month-to-month changes in oceanographic properties in the area. The ultimate aim is to understand the relation of winds and weather to the changes in ocean properties at the surface and to a depth of more than a quarter of a mile, particularly as they affect the commercial fisheries.

The Honolulu Laboratory scientists are finding that the oceanography of the Hawaiian area is complex. Within a depth of a few hundred feet there may be as many as 4 water types which retain their individuality and move with apparent independence of each other.

This finding may have important implications for fisheries, for the depths include those in which commercial fish are caught. This would mean that a fisherman fishing at the surface at a particular location might in 2 months be making his catch in subsurface waters differing in their own ways as sharply as the climates of New Guinea and the Sahara desert and containing different kinds or quantities of fish.

The properties being studied are the temperature of the water, salinity, and the amount of oxygen and phosphorus. All vary according to local influences, but more important according to the past history of the water types.

The pattern for the investigations has included 43 oceanographic stations 90 miles apart. Samples were obtained at 20 depths to about 4,500 feet. Since July 1964, casts to about 12,000 feet were made on three stations. Bathythermographs, which record temperature in the upper layers of the ocean, were taken at 30-mile intervals along the cruise tracks, except at 3 locations on each cruise, where they were taken at 10-mile intervals. In addition, meteorological observations were made, and the radiation from sun and sky recorded.

M/V "Townsend Cromwell" Cruise 16 (May 12-31, 1965): The flow pattern south of 20° N. continued to be setting slightly northwesterly as in the previous month but not quite as intensely during this cruise in the central North Pacific by the research vessel Townsend Cromwell. The vessel completed this cruise in a series of oceanographic cruises in the first phase of this study to find the rate of change in the distribution of properties in the trade wind zone of the central North Pacific. The area of operations on this cruise was bounded by latitude 10° N., 27° N. and longitude 148° W., 158° W.

Note: See Commercial Fisheries Review, August 1965 p. 32.



## Commercial Fisheries Research and Development Act

### GRANT-IN-AID FUNDS APPORTIONED TO STATES FOR FISCAL YEAR 1966:

On July 13, 1965, the U. S. Secretary of the Interior announced the first apportionment--a total of \$4,100,000--in grant-in-aid funds to

States under the Commercial Fisheries Research and Development Act of 1964.

The money was appropriated by Congress under Section 4 (a) of the Act for biological research and other studies and for supporting further development of the commercial fisheries resources of the United States.

Apportionment of the fund is based on the value of the commercial fishing industry of the various States, the Commonwealth of Puerto Rico, American Samoa, Guam, and the Virgin Islands. No State may receive more than 6 percent, or less than one-half of one percent, of the fund.

Under the research and development program, the States are reimbursed for up to 75 percent of the costs of approved projects. The research and development programs are administered by the Department of the Interior's Bureau of Commercial Fisheries.

The tabulation lists the apportionment of funds to each State and other entity for the 1966 fiscal year, which began July 1, 1965.

Note: See Commercial Fisheries Review, Dec. 1964 p. 118.



## Federal Purchases of Fishery Products

### DEFENSE SUBSISTENCE SUPPLY CENTER MOVES TO PHILADELPHIA AND CONSOLIDATES WITH DEFENSE PERSONNEL SUPPORT CENTER:

Effective July 10, 1965, the Headquarters Defense Subsistence Supply Center (DSSC) of the Department of Defense was moved from Chicago, Ill., to Philadelphia, Pa., and consolidated with the Defense Medical Supply Center (DMSC) and the Defense Clothing and Textile Supply Center (DCTSC) into one single organization named the Defense Personnel Support Center, located at 2800 South 20th St., Philadelphia, Pa., 19101.

Regional headquarters of the new Center will continue as heretofore: Alameda, Calif.; Brooklyn, N. Y.; Chicago, Ill.; Columbia, S. C.; Fort Worth, Texas; Kansas City, Mo.; Los Angeles, Calif.; New Orleans, La.; Richmond, Va.; and Seattle, Wash.

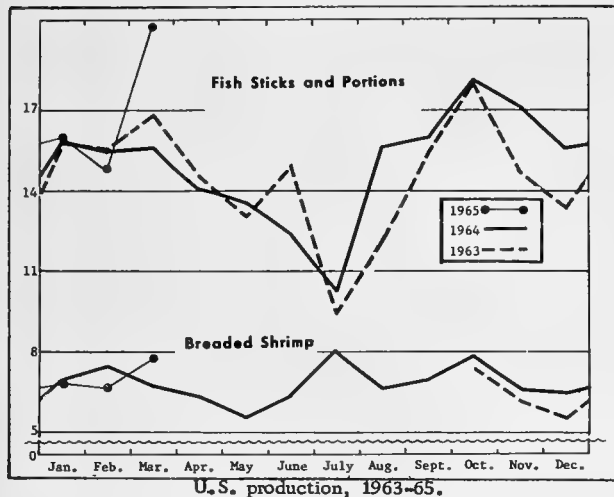


Apportionment of Funds for Fiscal Year 1966 Under Section 4 (a) of the Commercial Fisheries Research and Development Act of 1964 1/			
State and Area	Allocations	State and Area	Allocations
	\$1,000		\$1,000
Alabama	40.3	Nevada	20.5
Alaska	246.0	New Hampshire	20.5
Arizona	20.5	New Jersey	167.5
Arkansas	20.5	New Mexico	20.5
California	246.0	New York	178.7
Colorado	20.5	North Carolina	52.3
Connecticut	20.5	North Dakota	20.5
Delaware	38.7	Ohio	45.7
Florida	246.0	Oklahoma	20.5
Georgia	94.6	Oregon	118.3
Hawaii	35.0	Pennsylvania	56.6
Idaho	20.5	Rhode Island	26.6
Illinois	24.4	South Carolina	21.6
Indiana	20.5	South Dakota	20.5
Iowa	20.5	Tennessee	20.5
Kansas	20.5	Texas	246.0
Kentucky	20.5	Utah	20.5
Louisiana	246.0	Vermont	20.5
Maine	223.0	Virginia	173.1
Maryland	180.7	Washington	226.3
Massachusetts	246.0	West Virginia	20.5
Michigan	25.3	Wisconsin	20.5
Minnesota	20.5	Wyoming	20.5
Mississippi	129.1	American Samoa	51.6
Missouri	20.5	Guam	20.5
Montana	20.5	Puerto Rico	161.1
Nebraska	20.5	Virgin Islands	20.5
		Total . . .	4,100.0
1/Congress adjourned in 1964 before it was able to appropriate funds to implement Section 4(a) of the Act for fiscal year 1965. The apportionment for fiscal year 1966 represents the first appropriation by Congress to implement Section 4(a).			

## Fish Sticks and Portions

### U. S. PRODUCTION, JANUARY-MARCH 1965:

United States production of fish sticks and fish portions amounted to 50.8 million pounds during the first quarter of 1965, according to preliminary data. Compared with the same quarter of 1964, this was an increase of 3.6 million pounds or 7.7 percent. Fish portions (29.6 million pounds) were up 3.6 million pounds or 13.9 percent, and fish sticks (21.3 million pounds) were up less than 1 percent.



Cooked fish sticks (20.2 million pounds) made up 94.9 percent of the January-March 1965 fish stick total. There were 28.8 million pounds of breaded fish portions produced, of which 22.6 million pounds were raw. Unbreaded fish portions amounted to 716,000 pounds.

Table 1 - U. S. Production of Fish Sticks by Months and Type, January-March 1965 1/

Month	Cooked	Raw	Total
	(1,000 Lbs.)		
January .....	6,428	296	6,724
February .....	6,209	281	6,490
March .....	7,545	517	8,062
Total 1st Qtr. 1965 1/ .....	20,182	1,094	21,276
Total 1st Qtr. 1964 2/ .....	19,721	1,532	21,253
Total 1964 2/ .....	67,810	5,722	73,532

1/Preliminary.  
2/Revised.

The Atlantic States remained the principal area in the production of both fish sticks and fish portions, with 17.1 and 18.9 million pounds, respectively. The Inland and Gulf States ranked second with 9.9 million pounds of fish portions and about 2.0 million pounds of fish sticks. The remaining 3.0 million

Table 2 - U. S. Production of Fish Portions by Months and Type, January-March 1965 1/

Month	Breaded			Un-breaded	Total
	Cooked	Raw	Total		
	(1,000 Lbs.).				
January . . . . .	2,210	6,792	9,002	197	9,199
February . . . . .	1,652	6,424	8,076	180	8,256
March . . . . .	2,432	9,336	11,768	339	12,107
Tot.1st Qtr.1965 1/	6,294	22,552	28,846	716	29,562
Tot.1st Qtr.1964 2/	5,393	19,709	25,102	863	25,965
Total 1964 2/	20,956	82,135	103,091	2,541	105,632
1/Preliminary. 2/Revised.					

1/Preliminary.  
2/Revised.

pounds of fish sticks and fish portions were produced by firms in the Pacific States.

Note: See Commercial Fisheries Review, June 1965 p. 20, May p. 19, Jan. p. 28.



## Florida

### FISHERY LANDINGS AND TRENDS, 1964:

In 1964, the commercial catch of fish and shellfish landed at Florida ports was 178.0 million pounds with an ex-vessel value of \$29.5 million. Compared with 1963, landings decreased 8.2 million pounds, but the value increased \$1.8 million. Landings of shrimp--the leading species--were 44.5 million pounds (heads-on weight) with an ex-vessel value of \$15.3 million. Shrimp, black mullet (lisa), menhaden, and blue crab accounted for 68 percent of total landings. Fourteen species of finfish and four species of shellfish were landed in quantities greater than 1 million pounds.

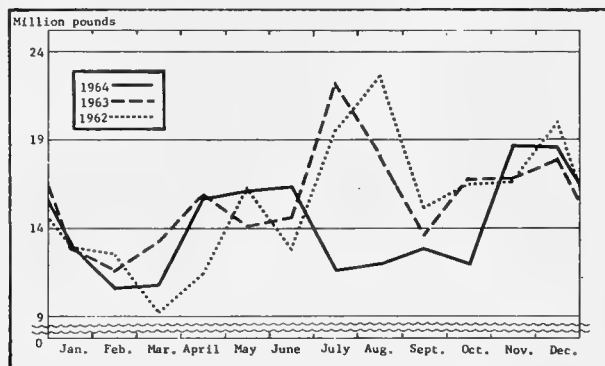


Fig. 1 - Florida landings by months, 1962-64.

**Shrimp:** Despite the fact that many Florida shrimp companies sent more of their vessels to work out of South American ports, domestic landings of shrimp at Florida ports in 1964 increased 5.0 million pounds over the previous year. The value of the 1964 shrimp

catch was up \$1.3 million. In contrast to 1963 when the price of shrimp declined steadily throughout the year, prices increased in 1964. The ex-vessel value of good quality 21-25 count (heads-off) shrimp landed at Tampa increased from 64.75 cents during January to a high of 82.50 cents a pound in December 1964. The market for shrimp remained strong all year.

**Oysters:** The oyster harvest in 1964 yielded 2.9 million pounds of meats, about 1.5 million pounds less than in the previous year. Florida's principal producing grounds in the Apalachicola-Eastpoint area yielded fewer oysters. However, during the fall season, large quantities of small oysters were observed, indicating better oyster production in the future. Generally, demand and prices were strong throughout the year.

**Crab:** The blue crab catch amounted to 21.0 million pounds--a decrease of about 3 percent from 1963. Demand for crab meat was strong throughout the year and again many processing firms imported crabs from other states. Generally, wholesale crab meat prices rose about 20 cents a pound over prices received in 1963. Stone crab landings amounted to over 900,000 pounds, an increase of about 15 percent compared with the previous year.

**Spiny Lobster:** Landings of spiny lobsters amounted to 3.6 million pounds, 1 percent above 1963. Production in the fall season of the year, although normal, failed to meet the demand. Ex-vessel prices to the fishermen increased to 65 cents a pound.

**Mackerel:** Although king and Spanish mackerel production was generally good during the early months of the year, the fall run of those species was disappointing. Slightly over 3.3 million pounds of king mackerel were caught in 1964, a drop of 33 percent from 1963. Spanish mackerel landings were 5.9 million pounds compared with 7.5 million pounds in 1963.

**Mullet:** Black mullet (*lisa*) landings increased 5 percent to 37.8 million pounds. During the year, many producers indicated an intention to ask the State legislature to enact a closed season for the period December 20-January 10. The main purpose of the law would be to keep mullet which have recently spawned off the market.

**Other Species:** Landings of fresh-water catfish were down 22 percent, while bluefish



Fig. 2 - Over-all view of part of a shrimp packing plant in Coral Gables, Fla. Note stainless steel walls.

and spot each declined 12 percent below the previous year. Grouper, red and yellowtail snapper, king whiting, and spotted sea trout were greater in volume. Due to an expanded European market, there was an expansion of commercial fishing for eels in the St. Johns River-Lake George area of Florida, with landings of some 122,000 pounds for the year. During past years, only 30,000 to 40,000 pounds of eels were reported annually.

**Imports:** Fishery products entering through the Miami Customs District during 1964 totaled 27.1 million pounds. Over 22.9 million pounds of shrimp were included in that total with 6 million pounds arriving from Venezuela and 4.5 million pounds from El Salvador. Twelve South and Central America countries and Mexico shipped shrimp to Florida in 1964.

**Processing:** In 1964, fishery firms in Florida processed and packaged seafood with a value of about \$56 million at the wholesale level. Over 50 million pounds of processed shrimp (frozen raw headless, breaded, peeled and deveined) valued at almost \$43 million was processed, while Florida's growing crab industry contributed nearly 3 million pounds of crab meat valued at about \$4 million. Other items processed were shucked oysters, fish fillets and steaks, cooked spiny lobsters, cooked stone crab claws, turtle chowder, canned mullet, and specialties.

The weather in Florida was generally good for fishing operations during 1964 despite the fact that Hurricanes Cleo, Dora, and Hilda passed over or close to ports of Florida. Very little damage to the fishing fleet or fish houses occurred as the result of the storms.

Several new and larger snapper vessels were added to the fleet in the northwest section of the State during the year. Shortly after the end of the year, two of those vessels

made a successful trip to waters off the north-west coast of Nicaragua.

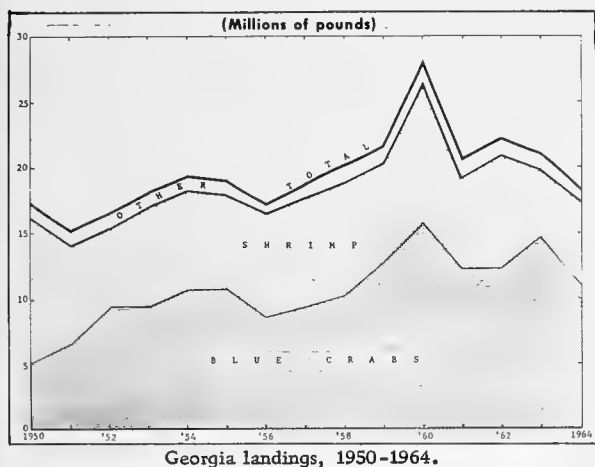
Note: See Commercial Fisheries Review, March 1965 p. 31.



## Georgia

### FISHERY LANDINGS AND TRENDS, 1964:

Landings of fish and shellfish at Georgia ports during 1964 were 18.3 million pounds, valued at \$3.0 million. Compared with 1963, that was a decrease of 13 percent in quantity, but an increase of 14 percent in value. Shrimp landings (heads-on weight) increased 491,300 pounds, while the blue crab catch was down nearly 3.0 million pounds. The leading species landed during 1964 were blue crab and shrimp. They accounted for 95 percent of the quantity and 93 percent of the value of the 1964 catch.



Georgia landings, 1950-1964.

Shrimp landings during 1964 were 5.9 million pounds (head-on weight), an increase of 9 percent above 1963, but 24 percent less than the average for the 5-year period 1959-63. The average ex-vessel shrimp price per pound (heads-on weight) during 1964 was 39 cents--6 cents higher than in 1963. The size composition of the 1964 shrimp catch was a factor affecting the average ex-vessel price. During 1963, shrimp of the 21-30 count size made up 20 percent of the landings, whereas in 1964 that size made up 34 percent of the catch.

Blue crab landings were 11.5 million pounds, a decrease of 3.0 million pounds below the previous year. Pot and trap crabs sold at 4 to 6 cents a pound, and otter trawl crabs from 3 to 5 cents a pound during 1964.

Oyster production in 1964 was 195,800 pounds of meats, a decline of 39,600 pounds from 1963.

Landings of all major species of finfish declined during 1964. Fish caught for human consumption decreased from 624,650 pounds in 1963 to 517,277 pounds in 1964.



## Great Lakes Fisheries Explorations and Gear Development

### LAKE SUPERIOR TRAWLING STUDIES CONTINUED:

M/V "Kaho" Cruise 25 (May-June 1965): The area of operations during this 38-day cruise in Lake Superior by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Kaho was between Munising, Mich., and Duluth, Minn. In addition to seasonal monitoring of previously established stations in the central portion of the lake, the cruise was extended into the western end where preliminary trawling explorations were conducted.

Primary objectives of the cruise were to: (1) determine the availability of various species of fish to bottom trawls; (2) locate additional areas suitable for trawling, particularly west of the Keweenaw Peninsula; (3) demonstrate commercial production potential of chubs with a larger net and longer drags; and (4) study the vertical and horizontal distribution patterns of fish concentrations with an echo-sounder. Other objectives were to: (1) obtain length-frequency data on various species of fish to augment biological studies; (2) collect lake trout biological data; (3) collect fish and bottom material for botulism studies; and (4) collect chub samples for technological studies involving processing methods.

Highlights included the continued success of trawling for chubs in waters first explored immediately adjacent to the eastern side of the Keweenaw Peninsula in 1964 and the attainment of substantial evidence that chubs can be caught readily in trawls on the western side of the peninsula all the way to Duluth.

Initial operations west of the Keweenaw Peninsula were very encouraging with the location of 70 miles of trawlable grounds from

Fourteen Mile Point near Ontonagon, Mich., to a point about 25 miles northeast of Ashland, Wis., and 60 miles of clear bottom from Sand Island (near Cornucopia, Wis.) to Duluth.

The species composition of the total catch of this cruise (21,600 pounds) was 91 percent chubs, 3.5 percent lake trout, 2 percent whitefish, 1.5 percent smelt, and 1 percent suckers.

Concentrations of chubs were located on both sides of the Keweenaw Peninsula. On the east side of the peninsula, consistently good catches were made in depths of 44 to 46 fathoms, while on the western side of the peninsula, best catches occurred between 33 to 37 fathoms. Drags made in the Grand Traverse Bay area yielded catches of chubs up to 2,600 pounds in a one-hour drag with a 52-foot (headrope length) standard trawl net, and 2,200 pounds in 40 minutes with a 70-foot (headrope length) wing trawl. Commercial production potential was also demonstrated west of the Keweenaw Peninsula where a catch of 1,500 pounds of chubs was made in a half-hour drag at 35 fathoms north of Sand Island. A total of 19,500 pounds of chubs was caught during the cruise. Drags producing chubs in amounts ranging from one to 2,600 pounds totaled 25.2 hours of fishing time. Although the production rate was much higher in certain areas and depths, the average catch rate for the 25.2 hours of fishing was 776 pounds an hour, an amount considered of commercial significance. Two-thirds of the total catch of lake trout were taken in water less than 33 fathoms where the average catch of trout per drag was 13 pounds, while in water deeper than 33 fathoms an average of only 6 pounds of trout per drag was taken. Three-quarters of the trout taken in the shallow water were contained in 9 drags and once such concentrations are located they can be avoided. Efforts to return trout to the water in good condition were successful throughout the investigations.

A comparative day-night study was conducted in Keweenaw Bay to determine differences in catch rates. Although slightly more smelt were caught at night in shallower water, the results were inconclusive. During the cruise, demonstrations were made for commercial fishermen and assistance was provided to the experimental commercial trawler Nichevo from Bayfield, Wis.

**FISHING OPERATIONS:** A total of 79 drags was made during the cruise--70 with a 52-foot (headrope) Gulf of Mexico-type fish trawl and

9 with a 72-foot modified wing trawl. Fifty-one drags were made between Munising and the Keweenaw Peninsula and 28 were made from the Keweenaw Peninsula west to Duluth. All drags were of 30-minute duration except 16 which were terminated early due to encounters with rough bottom or set fishing gear, or for exploratory purposes in unfamiliar waters, or for assessment of commercial potential. Seven drags were extended to one hour to study the production rates of longer drags. Snags were encountered during 7 drags. No damage resulted on 2 of them, minor damage occurred on 2, and major net damage occurred in drags made in 13 fathoms off Superior, Wis., 20 fathoms in Shelter Bay, and 20 fathoms in Keweenaw Bay.

**FISHING RESULTS (Munising to Keweenaw Peninsula):** Good to excellent catches of chubs were made east of the Keweenaw Peninsula in the Grand Traverse Bay to Bete Gris Bay area in depths from 40 to 45 fathoms. Twelve drags made in that area yielded from 430 to 2,600 pounds per drag and from 750 to 3,300 pounds an hour. The hourly catch rate for the 12 drags was 1,405 pounds. The largest individual catch was made with a 52-foot (headrope) semiballoon fish trawl while the best catch rate was obtained with a 72-foot (headrope) wing trawl. Examination of 11 samples of chubs (totaling 241 pounds) revealed over 86 percent (by weight) were over 9 inches long.

Catches of common whitefish up to 230 pounds per drag were made in Munising Bay, Huron Bay, and in Keweenaw Bay at depths between 8 and 35 fathoms. Cisco and smelt were taken in only small quantities in all areas monitored. Catches of lake trout amounted to about 12.5 pounds per half-hour drag in depths of 32 fathoms and less, and 6.5 pounds per half-hour in depths of 33 fathoms and over. Catches of other species were insignificant and included round and pigmy whitefish, burbot, alewife, and stickleback.

**FISHING RESULTS (Houghton, Mich., to Duluth):** In the areas monitored from Houghton to Duluth, the heaviest concentrations of chubs were consistently located in depths from 32-37 fathoms. Good catches of chubs (450 and 270 pounds) were taken in the Ontonagon area from Fourteen Mile Point to the Porcupine Mts. Catches ranging from 300 pounds to 1,500 pounds per half-hour were taken in that depth range from an area extending from just north of Sand Island in the Apostles to a point directly north of the



Brule River (12 miles WNW. of Port Wing). No significant amounts of lake trout were taken in any drags east of Bayfield, Wis., while in the Apostle Islands area and off Cornucopia, concentrations of lake trout were heavier. However, trout could be successfully avoided by fishing deeper than 32-33 fathoms. A comparison tow was made with the trawler Nichevo fishing at 33-34 fathoms and the vessel Kaho at 27-28 fathoms. The Kaho took 10 times more trout. In all drags west of the Keweenaw Peninsula the average taken per 30-minute drag was 10 pounds while beyond 33 fathoms the average was 5 pounds per 30-minute drag.

The largest catches of smelt were 35 and 45 pounds taken in 12-13 fathoms off Duluth. Catches of 90 and 100 pounds of longnose suckers were taken in the same area. No other species were taken in significant amounts and only 3 pounds of alewife were taken in all drags made. Other species in the trawl catches included burbot, sculpins, and whitefish.

Hydrographic data collected during the cruise included the recording of thermal gradients using a bathythermograph and continuous surface temperature recorder. Bottom temperatures ranged from 35° to 40° F. and surface temperatures ranged from 35° to 45° F.

Note: See Commercial Fisheries Review, February 1965 p. 22.

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#### LAKE MICHIGAN TRAWLING STUDIES CONTINUED:

M/V Kaho Cruise 26 (June 21-30, 1965): A 10-day exploratory fishing cruise in northern Lake Michigan and Green Bay by the U. S. Bureau of Commercial Fisheries vessel Kaho was completed on June 30, 1965. The primary objective of the cruise was to extend knowledge regarding the seasonal and bathymetric distribution and abundance of alewife, smelt, chub, and yellow perch stocks and their availability to bottom trawls. Secondary objectives were to: (1) collect fish and bottom samples for botulism studies; (2) obtain length-frequency data on chubs and alewife to supplement biological studies; (3) collect scale samples from alewife; and (4) collect sculpin samples for technological studies.

Commercially significant quantities of alewife were taken in all areas monitored with the best catches occurring in the shallower depths, reflecting the seasonal inshore

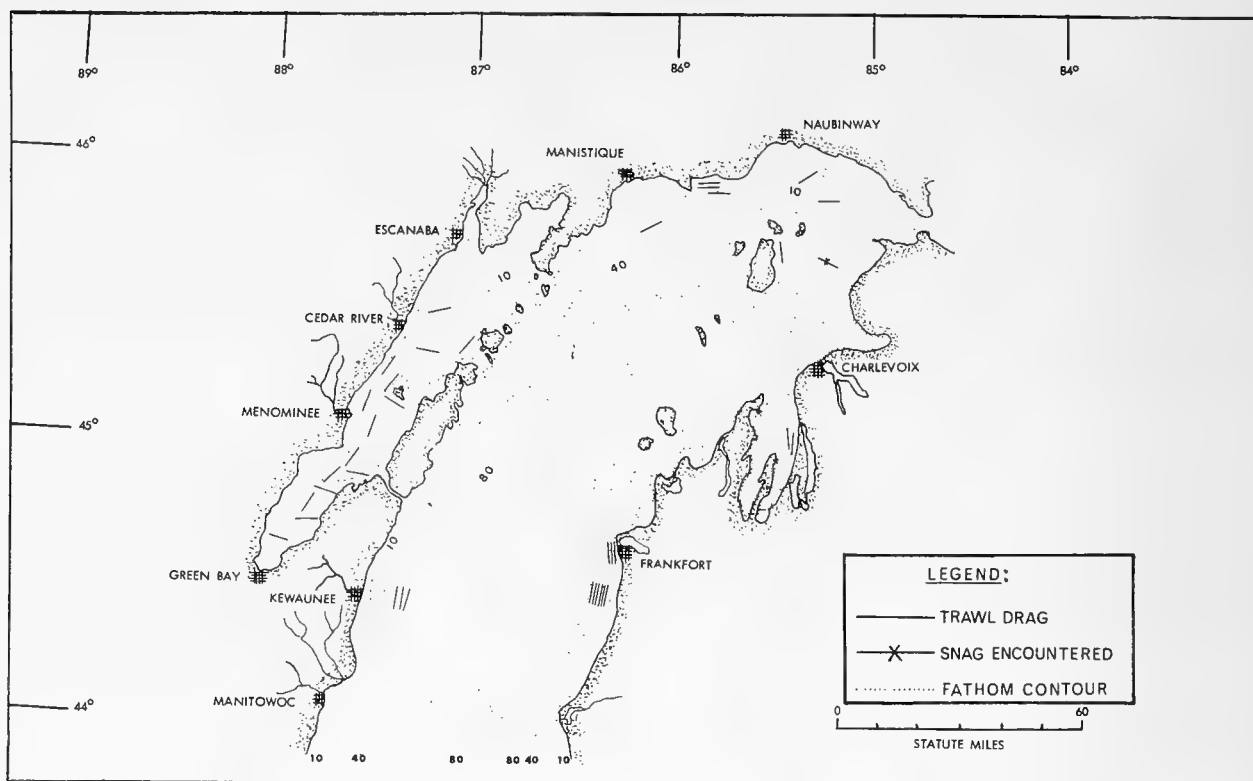
concentration of the species. Chub catches were extremely light in all areas covered with the best catches occurring off Frankfort, Mich., and in Grand Traverse Bay only a few yellow perch were taken during the cruise. Catches of smelt and whitefish were also light in all areas.

Commercial vessels on Lake Michigan fishing specifically for alewives have taken outstanding catches. In early summer 1965, trawlers operating from Saugatuck, Mich. caught up to 9,000 pounds of alewives in 6 minutes towing time, and the trawl fleet in Wisconsin reported daily catches ranging from 25,000 to 80,000 pounds per fishing day. Pound-net fishermen in Green Bay took catches of up to 72,000 pounds a day off Menominee, Mich.

**FISHING OPERATIONS:** Thirty-nine drags were completed with a 52-foot (head-tape) fish trawl of which 24 were in the open lake and 15 in Green Bay. All drags were of 30 minutes duration except 3 which were terminated early due to snags, rough bottom, or the presence of set fishing gear. Major trawl damage occurred when the net encountered a snag near Grays Reef in northern Lake Michigan. Bottom topography and vertical distribution of fish were continuously monitored and recorded with a high-resolution echo-sounder.

**FISHING RESULTS:** Northern Lake Michigan: Commercially significant catches of alewife were taken in Grand Traverse Bay at 12 fathoms and in northern Lake Michigan from Manistique to Naubinway at 10, 12, and 22 fathoms. Chub catches were insignificant with the best catches taken at 25 fathoms off Frankfort (270 pounds) and at 45 fathoms in Grand Traverse Bay (200 pounds). Smelt were taken in only minimal amounts. Five yellow perch totaling 8 pounds were taken in Grand Traverse Bay. Whitefish were taken in amounts of up to 35 pounds per drag at 12 fathoms in Grand Traverse Bay, at 14 fathoms off Beaver Island, and at 10 and 12 fathoms in the northern area of the lake between Naubinway and manistique.

Green Bay: Good Catches of alewife were taken in Green Bay -- the best catches, 630 and 950 pounds, occurred at 5 fathoms in the southern area of the bay. Smelt catches were light except for one 480-pound catch taken at 12 fathoms south of Menominee. Only 3 individual yellow perch were taken in all drags made in the bay. Catches of other species were insignificant.



Lake Michigan explorations, M/V Kaho cruise 26.

**HYDROGRAPHIC DATA:** Surface water temperatures of Lake Michigan ranged from 43° to 55° F; those in Green Bay from 60° to 63° F. Fishing (bottom) temperatures ranged from 39° to 50° F.

Note: See Commercial Fisheries Review, July 1965 p. 22.

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#### LAKE HURON TRAWLING STUDIES:

M/V Kaho Cruise 27: The U. S. Bureau of Commercial Fisheries research vessel Kaho was scheduled to depart July 14, 1965, on a 22-day exploratory fishing cruise in Lake Huron. The cruise is the first in a series to explore more effective and efficient methods for capturing and handling the fish stocks in Lake Huron.

Saginaw Bay and adjacent waters in central and southern Lake Huron were to be the main areas of operation during the cruise. The primary purpose was to determine the location, bathymetric distribution and relative abundance of various species of fish and their seasonal availability to standard bottom trawls. Mesh-selectivity studies were also

planned with particular emphasis directed towards yellow perch.



#### Gulf Fisheries Explorations and Gear Development

##### SHRIMP GEAR STUDIES CONTINUED:

M/V George M. Bowers Cruise 60 (May 24-July 1, 1965): This cruise, which consisted of short trips in St. Andrews Bay, Fla., was a continuation of the Bureau of Commercial Fisheries studies on the electrical parameters necessary to deburrow shrimp from varying bottom types. During the cruise, SCUBA divers recorded the rates of deburrowing and escape reactions of shrimp exposed to different electrical voltages and pulse rates. The 2,200 feet of color motion-picture film exposed during the cruise provided a record of the shrimp behavior under various conditions for detailed study on shore. Divers reported more rapid deburrowing behavior with increased voltages generated within the test area.

Shrimp deburrowing behavior from a soft sand bottom found in St. Andrews Bay was studied during the cruise. Similar behavior observations of shrimp burrowed in hard sand bottom exposed to various electrical voltages were initiated on the Tortugas fishing grounds during Cruise 59 of the George M. Bowers. Those types of behavioral observations will be undertaken on different bottom types on future cruises to determine whether or not the type of substrata affects escape reactions of electrified shrimp.

Note: See Commercial Fisheries Review, July 1965 p. 24.



## Gulf Fishery Investigations

### SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-30 (June 11-24, 1965): Small brown shrimp (68 count) again were evident, as in May, throughout the sampling area covered during this cruise. As part of a continuing Gulf of Mexico shrimp distribution study, 8 statistical areas were covered by the chartered research vessel Gus III, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex.

A total of 27 standard 3-hour tows with a 45-foot flat trawl, 46 plankton tows, 53 bathythermograph (BT), and 176 water (Nansen bottle) casts were made on the cruise.

The best catches of small brown shrimp were made in areas 19 and 20--mostly in the 11-20 fathom depth range. Catches of the same size brown shrimp also were made in the up to 10-fathom depth in several other areas but the amounts taken in each tow were generally small.

The over 20-fathom depth range in most areas yielded larger brown shrimp of 12-15 and 15-20 count. Areas 16 and 17, in particular, yielded excellent catches (38 and 46 pounds, respectively) of 12-15 count shrimp from 25 fathoms.

White shrimp catches were mostly light in all areas worked but ran to large (15-20 count) shrimp. Areas 16 and 17 yielded the best white catches, with an average catch of 14 pounds in the up to 10-fathom depth from each of those areas. Smaller amounts of white shrimp ranging from 2 to 8 pounds in each tow from other areas worked were also taken in the up to 10-fathom depth.

Only a scattering of pink shrimp were caught during the cruise, mostly all small.

The vessel also occupied a 24-hour current measurement station in 8 fathoms of water south of Morgan City, La., to supplement data previously collected on white shrimp spawning grounds.

Note: See Commercial Fisheries Review, August 1965 p. 40.



## Industrial Fishery Products

### U. S. FISH MEAL, OIL, AND SOLUBLES:

Major Indicators for U. S. Supply, May 1965: United States production of fish meal and fish oil in May 1965 was lower by 27.7 and 25.5 percent, respectively, as compared with May 1964. Production of fish solubles was lower by 19.4 percent.

Major Indicators for U. S. Supply of Fish Meal, Solubles, and Oil, May 1965					
Item and Period	1/1965	1964	1963	1962	1961
<b>Fish Meal:</b>	(Short Tons)				
Production:					
May	23,157	32,047	39,902	40,504	34,446
Jan.-May 2/	42,119	47,698	56,216	60,665	48,103
Year 3/	-	235,252	255,907	312,259	311,265
Imports:					
May	30,475	59,543	30,399	25,269	25,116
Jan.-May	165,384	221,914	163,482	114,433	88,509
Year	-	439,143	376,321	252,307	217,845
<b>Fish Solubles 4/:</b>					
Production:					
May	10,364	12,859	16,997	16,786	13,629
Jan.-May 2/	15,970	20,152	27,395	26,762	22,428
Year 3/	-	93,296	107,402	124,649	112,254
Imports:					
May	167	263	438	265	283
Jan.-May	3,006	1,802	2,116	3,418	1,012
Year	-	4,505	7,112	6,308	6,739
<b>Fish Oils:</b>	(1,000 Lbs.)				
Production:					
May	22,291	29,939	33,544	33,436	34,674
Jan.-May 2/	34,158	35,763	41,396	41,598	39,339
Year 3/	-	180,198	185,827	250,075	258,118
Exports:					
May	316	9,329	22,150	6,491	3,192
Jan.-May	12,059	56,022	97,551	58,084	47,092
Year	-	151,469	262,342	123,050	122,486

1/Preliminary

2/Data for 1965 based on reports which accounted for the following percentage of production in 1964: Fish meal, 89 percent; solubles, 89 percent; and fish oils, 99 percent.

3/Small amounts (10,000 to 25,000 tons) of shellfish and marine animal meal and scrap not reported monthly are included in annual totals.

4/No homogenized fish was produced in 1964.

\* \* \* \* \*

Production by Areas, June 1965: Preliminary data on U. S. production of fish meal, oil, and solubles for June 1965 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

U. S. Production 1/ of Fish Meal, Oil, and Solubles, June 1965 (Preliminary) with Comparisons			
Area	Meal Short Tons	Oil 1,000 Pounds	Solubles Short Tons
June 1965:			
East & Gulf Coasts 2/ . . . . .	42,952	38,286	16,446
West Coast 3/ . . . . .	2,285	305	1,226
Total . . . . .	45,237	38,591	17,672
Jan.-June 1965			
Total . . . . .	87,356	72,749	33,642
Jan.-June 1964			
Total . . . . .	96,651	78,624	39,025
1/Does not include crab meal, shrimp meal, and liver oils.			
2/Includes a small quantity from the Great Lakes.			
3/Includes American Samoa and Puerto Rico.			

\* \* \* \* \*

Production, May 1965: During May 1965, a total of 23,157 tons of fish meal and 22.3 million pounds of marine-animal oil was produced in the United States. Compared with May 1964 this was a decrease of 8,890 tons of fish meal and about 7.6 million pounds of marine-animal oil. Fish solubles production a-

U. S. Production of Fish Meal, Oil, and Solubles May 1965 1/ with Comparisons				
Product	May		Jan.-May	
	1/1965	1964	1/1965	1964
Fish Meal and Scrap: . . . . . (Short Tons). . . . .				
Herring	2/	-	1,275	415
Menhaden 3/	18,232	22,700	25,700	25,747
Tuna and mackerel	1,777	1,486	8,899	6,485
Unclassified	3,148	7,861	6,145	15,051
Total	23,157	32,047	42,119	47,698
Shellfish, marine-animal meal and scrap	4/	4/	4/	4/
Grand total meal and scrap	4/	4/	4/	4/
Fish Solubles:				
Menhaden	8,042	9,399	10,189	10,769
Other	2,322	3,460	5,781	9,383
Total	10,364	12,859	15,970	20,152
Oil, body: . . . . . (1,000 Pounds). . . . .				
Herring	2/	-	576	132
Menhaden 3/	21,758	28,480	31,456	31,543
Tuna and mackerel	275	221	1,358	1,127
Other (including whale)	258	1,238	762	2,961
Total oil	22,291	29,939	34,152	35,763
1/ Preliminary data.				
2/ Included in other or unclassified.				
3/ Includes a small quantity of thread herring.				
4/ Not available on a monthly basis.				

mounted to 10,364 tons--a decrease of 2,495 tons as compared with May 1964.

\* \* \* \* \*

#### U. S. FISH MEAL AND SOLUBLES:

Production and Imports, January-May 1965: Based on domestic production and imports, the United States available supply of fish meal for the first 5 months in 1965 amounted to 207,503 short tons--62,109 tons (or 23.0 percent) less than during the same period in 1964. Domestic production was 5,579 tons (or 11.7 percent) less, and imports were 56,530 tons (or 25.5 percent) lower than in January-May 1964. Peru continued to lead other countries with shipments of 141,119 tons.

The United States supply of fish solubles during January-May 1965 amounted to 18,976 tons--a decrease of 13.6 percent as compared with the same period in 1964. Domestic production dropped 20.8 percent, but imports of fish solubles increased 66.8 percent.

U. S. Supply of Fish Meal and Solubles, January-May 1965			
Item	Jan.-May		Total
	1/1965	1964	1964
. . . . .(Short Tons). . .			
Fish Meal and Scrap:			
Domestic production:			
Menhaden. . . . .	25,700	25,747	160,349
Tuna and mackerel . . . . .	8,999	6,485	21,113
Herring . . . . .	1,275	415	8,881
Other . . . . .	6,145	15,051	44,909
Total production . . . . .	42,119	47,698	235,252
Imports:			
Canada . . . . .	17,020	24,096	54,769
Peru . . . . .	141,119	181,196	348,025
Chile . . . . .	3,908	9,104	12,942
So. Africa Rep. . . . .	700	6,138	18,581
Other countries. . . . .	2,637	1,380	4,826
Total imports . . . . .	165,384	221,914	439,143
Available fish meal supply. . .	207,503	269,612	674,395
Fish Solubles:			
Domestic production 2/ . . .	15,970	20,152	93,296
Imports:			
Canada . . . . .	766	877	1,553
So. Africa Rep. . . . .	-	705	987
Other countries . . . . .	2,240	220	1,965
Total imports . . . . .	3,006	1,802	4,505
Available fish solubles supply	18,976	21,954	97,801
1/Preliminary.			
2/50-percent solids.			



## Maine

### FISHERIES, 1964:

Commercial fishery landings in Maine during 1964 amounted to 192.6 million pounds with an ex-vessel value of \$22.0 million--a decline of 33 percent in quantity, but a gain of 3 percent in value from 1963.



Fig. 1 - Maine fisherman removing lobsters from his traps.

The lobster fishery accounted for most of the increase in value. Maine lobster landings of 21.4 million pounds in 1964 had an ex-vessel value of \$14.2 million, while lobster landings in 1963 of 22.8 million pounds were worth only \$12.6 million. Lobster landings accounted for 65 percent of the value of the total catch in 1964.



Fig. 2 - Close-up of Maine fisherman digging bloodworms.

The overall decline in 1964 landings was due mainly to a sharp drop in herring landings--down from 152.3 million pounds in 1963 to 60.9 million pounds in 1964. Ocean perch landings also dropped from 63.9 million pounds in 1963 to 58.9 million pounds in

1964. The decline was partly offset by an increase in whiting landings from 15.9 million pounds in 1963 to 25.3 million pounds in 1964.

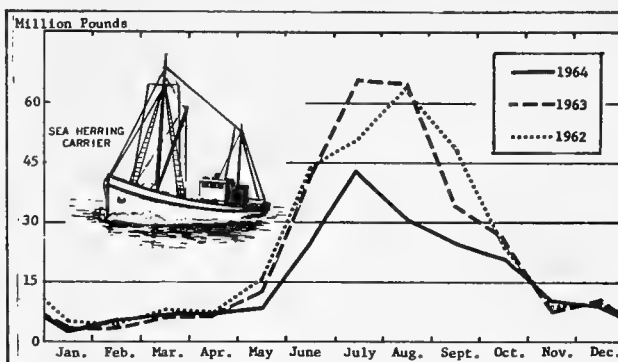


Fig. 3 - Maine landings by months, 1962-64.

Sea herring, ocean perch, whiting, and lobster accounted for 86 percent of Maine's total catch in 1964. Other leading species landed in Maine during 1964 were cod 2.4 million pounds, haddock 2.9 million pounds, white hake 3.5 million pounds, flounder (all species) 1.2 million pounds, mackerel 488,000 pounds, crab 2.0 million pounds, soft clam meats 1.8 million pounds, and sea scallop meats 916,900 pounds. The harvest of sea moss amounted to 2.5 million pounds, and production of blood and sand worms totaled 1.5 million pounds with a value of \$1.2 million.

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### UNIVERSITY OF MAINE RESUMES MARINE RESEARCH:

Plans to resume a marine research program were announced by the University of Maine in the spring of 1965 after a 130-acre site on the Damariscotta River in Walpole was donated to the University for the establishment of a marine biological laboratory. It will be known as the Ira C. Darling Center for Research, Teaching, and Service.

The location on the Damariscotta River gives protection from the weather while providing access to the ocean. The property also has adequate buildings to house initial research facilities.

Research at the new center, which was scheduled to begin in the summer of 1965, will include the cataloguing and identification of all forms of marine life to be found in the immediate vicinity. Future projects may in-

clude cooperative research with Federal and State agencies.

The president of the University of Maine said the new research center "would provide much-needed facilities for oceanographic studies in a State that has had long and close ties with the sea."



## Maryland

### FISHERY LANDINGS AND TRENDS, 1964:

Landings of fish and shellfish at Maryland ports during 1964 were 70.0 million pounds, valued at \$11.8 million--an increase of 26 percent in quantity and 10 percent in value as compared with 1963. Blue crabs, soft clams, and oysters accounted for 59 percent of the 1964 catch.

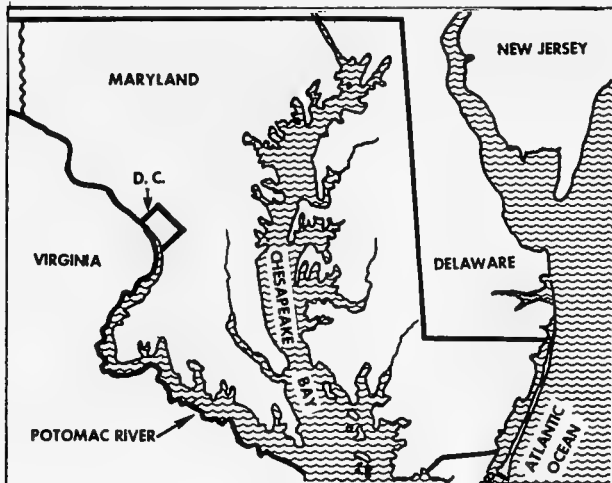


Fig. 1 - Maryland fishing areas.

**Crabs:** Hard blue crab landings totaled 21.6 million pounds in 1964, an increase of 4.6 million pounds over 1963. Crab ex-vessel prices averaged higher in 1964 as did crab meat prices due to a shortage of crabs for picking.

Soft and peeler crab landings in 1964 totaled 3.5 million pounds (approximately 1,165,900 dozen), a 66-percent increase over 1963.

**Soft Clams:** Record soft clam landings in 1964 of 680,400 bushels (yielding 8,164,332 pounds of clam meats) represented a 19-percent increase over the 1963 total. The unrestricted clamming allowed in the Potomac River in 1964 contributed to the record catch.



Fig. 2 - Picking crab meat from blue crabs in a Maryland plant.

Ex-vessel prices averaged lower than in 1964 due to the larger supply.

**Oysters:** The 1964 oyster harvest of 1,702,630 U. S. bushels (yielding 8,104,516 pounds of oyster meats) was up slightly from the 1963 record-low. But the 1964 harvest was the second lowest on record. The spring catch was light as oysters became scarce, and their yield was poor. Local packers again purchased shell and shucked oysters from the Gulf States to supply orders. The fall oyster harvest improved considerably over the previous year, although ex-vessel prices were down.

The MSX organism which has caused extensive oyster mortalities in lower Chesapeake Bay extended its range to include larger portions of Tangier Sound and its tributaries along with Pocomoke Sound. Higher salinities over the past two years may have played a roll in the spread of the parasite.

**Finfish:** Maryland landings of finfish in 1964 totaled 28.2 million pounds valued at \$1.5 million, as compared with 21.1 million pounds valued at \$1.4 million in 1963. The 1964 landings of menhaden (5.7 million pounds) and scrapfish (9.5 million pounds) accounted for much of the increase in quantity.

Landings of striped bass--Maryland's leading foodfish--dropped from 3.7 million pounds in 1963 to 3.3 million pounds in 1964. The white perch catch of 638,232 pounds in 1964 was down sharply from the 1.4 million pounds landed in 1964. Landings of alewife (1.3 million pounds) were also down. There



was a small increase in 1964 landings of shad (890,085 pounds) and fluke (556,521 pounds).

In 1964, five West Coast tuna purse-seine vessels delivered to Maryland 1.4 million pounds of bluefin, 1.1 million pounds of skipjack, and 0.3 million pounds of yellowfin tuna (included in the landings were about 0.5 million pounds of tuna caught in the Pacific Ocean).



## Massachusetts

### FISHERIES, 1964:

Landings of fish and shellfish in Massachusetts in 1964 totaled 409.6 million pounds with an ex-vessel value of \$35.2 million--a decline of 5 percent in quantity and 4 percent in value from 1963. Fishermen landed 33 percent of the 1964 catch at New Bedford, 31 percent at Gloucester, 26 percent at Boston, and 10 percent at other Massachusetts ports.



Fig. 1 - Mending nets at sea aboard a New England groundfish trawler.

Ocean perch landings at Gloucester dropped from 43.2 million pounds in 1963 to 29.1 million pounds in 1964. That was a major factor in the overall decline in Massachusetts landings.



Fig. 2 - Fishing trawlers tied up at Boston Fish Pier for unloading. At right in foreground is the New England Fish Exchange building.

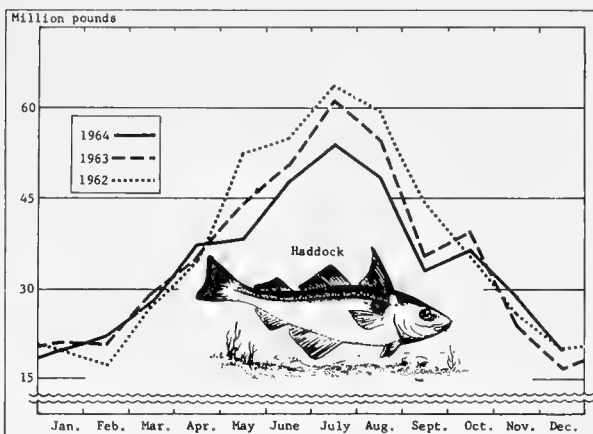


Fig. 3 - Massachusetts landings by months, 1962-64.

At New Bedford, there was a decline of 3.0 million pounds in landings of sea scallop meats, but an increase of 1.9 million pounds in landings of yellowtail flounder. Total landings in 1964 at New Bedford, as well as at Boston, were almost the same as in 1963.

Massachusetts Landings, 1964 and 1963				
Species	1964		1963	
	Quantity Pounds	Value Dollars	Quantity Pounds	Value Dollars
Alewives, round . . .	3,998,630	39,985	10,896,830	102,836
Cod, drawn . . . . .	29,504,382	2,363,568	31,474,840	2,614,781
Cusk, drawn . . . . .	1,683,995	98,107	1,263,762	86,627
Flounders, round:				
Blackback . . . . .	13,809,239	1,317,585	11,721,826	1,331,955
Dab . . . . .	5,530,718	376,816	4,601,682	352,612
Fluke . . . . .	1,358,228	441,591	2,281,417	710,653
Gray sole . . . . .	2,906,383	317,347	2,364,250	288,285
Lemon sole . . . . .	2,083,829	426,909	1,957,718	487,971
Yellowtail . . . . .	70,933,339	4,876,011	68,873,761	4,575,587
Haddock, drawn . . .	114,261,114	11,556,406	106,074,820	11,442,783
Hake:				
Red, round . . . . .	2,875,870	32,790	5,067,852	54,822
White, dressed . . .	2,426,103	176,677	1,885,190	125,498
Halibut, drawn . . .	196,699	71,698	154,402	57,166
Herring, sea, round .	1,962,969	36,954	1,850,225	34,785
Mackerel, round . .	2,725,435	172,224	1,920,230	184,170
Ocean perch, round .	30,331,669	1,280,520	44,386,697	2,210,985
Ocean pout, round .	2,453,115	32,625	-	-
Pollock . . . . .	10,557,807	612,498	10,726,995	595,996
Swordfish, dressed .	870,522	308,396	1,294,746	399,895
Tuna, round:				
Bluefin . . . . .	2,058,223	143,482	4,924,034	267,750
Skipjack . . . . .	1,154,040	84,269	1,587,585	78,690
Unclassified . . . .	-	-	8,086	1,330
Whiting:				
Round . . . . .	56,303,425	1,215,270	61,249,309	1,427,206
Dressed . . . . .	1,057,690	47,556	3,322,129	135,686
Wolffish, drawn . .	666,938	36,637	598,024	37,413
Unclassified fish . .	32,265,091	766,489	31,403,930	746,407
Lobsters, northern .	1,694,511	898,745	1,405,174	657,663
Shrimp . . . . .	6,925	916	23,068	2,952
Sea scallop meats . .	13,719,185	7,447,125	16,607,715	7,708,620
Squid . . . . .	234,140	11,245	1,755,990	94,549
Total . . . . .	409,630,214	35,190,441	431,682,287	36,815,673

Note: Includes all Massachusetts commercial landings except a small quantity taken in inshore fisheries. In 1963, the landings shown above accounted for 97.7 percent of the total Massachusetts catch. Weights shown represent fresh fish as landed and the values are those received by the vessels.

Overall Massachusetts landings were down for ocean perch, sea scallop meats, whiting, tuna, cod, fluke, swordfish, alewife, and red hake. But there was a noticeable increase in landings of haddock, most species of flounder (other than fluke), and mackerel.



## **New Jersey**

### **FEDERAL GRANT TO AID OYSTER INDUSTRY:**

The signing in Washington of a \$200,000 Federal-State contract under which intensive efforts will be made to restore the New Jersey oyster industry was announced July 20, 1965.

New Jersey thus became the first State to receive a Federal grant under Section 4(a) of Public Law 88-309, known as the Commercial Fisheries Research and Development Act of 1964, which is administered by the U. S. Bureau of Commercial Fisheries. Under the contract, the State is matching \$100,000 provided by Federal funds.

The New Jersey oyster industry, once valued at more than \$10 million annually, was virtually destroyed in 1957/58 by a shellfish disease known as MSX. Research has shown that a small percentage of the residual oysters may be immune to the disease and by using those survivors as seed, the State hopes to revive the industry in Delaware Bay and the Mullica River.

The New Jersey Commissioner of Conservation and Economic Development said that 2 million bushels of oyster shells will be purchased to improve the setting areas during the present oyster spawning season. It is planned to provide at least a million bushels of shells for that purpose each year for the following 5 years.

The initial planting of shells was expected to be completed in August 1965, and sample tests of the spawning results began in September. All work will be supervised by the Director of the New Jersey Division of Shell Fisheries in conjunction with the Shell Fisheries Council, and the Oyster Research Laboratory of Rutgers--the State University.



## **North Atlantic**

### **SOVIET FISHING ACTIVITY OFF COAST, JULY 1965:**

Soviet fishing activity in the Northwest Atlantic commenced in July 1965 with a fleet of about 100 vessels consisting of 20 factoryship stern trawlers, 69 side trawlers, 7 processing and refrigerated transport vessels, 3 base

ships, and 1 tug. This compared with an estimated 180 vessels sighted in June and 68 vessels in July 1964.

During the month there was a week-by-week decline in vessel activity, so that by the end of July not a single Soviet fishing vessel was reported or sighted on Georges Bank and areas south of Nantucket. It was the first time that a complete withdrawal of Soviet vessels occurred during that time of year since they appeared on the scene in 1961. A marked decline in activity was noted in July 1964, but there was a quick return to a large, concentrated fleet in August and September. At that time they converged on a tremendous herring fishery during the time of spawning on the Georges Shoals area.

The abrupt shift in activity during July may conceivably be attributed mainly to lagging fish production--principally whiting and herring--and no doubt has prompted a greater emphasis on a known productive whiting area along eastern Nova Scotia. It has been previously reported that the Soviets were taking only moderate catches of fish on Georges Bank and the area south of Nantucket and consequently have deployed their fleet operation accordingly. It was believed this absence of activity might only be temporary.

During July the main Soviet fishing operation was generally confined to an area 30 to 40 miles south of Nantucket Island. United States fishing vessels had abandoned that area some weeks previous due to poor fishing. Small groups of vessels were located along the eastern regions of Georges Bank but were either under way or engaged in vessel repair and replenishing supplies.

As of the end of July it was estimated that 15 factoryship stern trawlers were operating along the Cultivator Shoals area where United States fishermen had reported seeing a large body of whiting.

Note: See Commercial Fisheries Review, August 1965 p. 45.



## **North Atlantic Fisheries Explorations and Gear Development**

### **SURF CLAM SURVEY CONTINUED:**

M/V Delaware Cruise 65-4 (May 3-June 3, 1965): This cruise by the U. S. Bureau of

Commercial Fisheries exploratory fishing vessel Delaware off the coast of Virginia was a continuation of an Atlantic surf clam survey conducted during the summer of 1963 and 1964. The survey was initiated in cooperation with the Sea Clam Packers Committee of the Oyster Institute of North America.

Surf Clam Area VI off the coast of Virginia was explored. The size of the area is about 1,900 square miles. The depth of water within the area varies from 4 to 60 fathoms. Although 735 stations were occupied during the cruise, less than one-half of the total area was covered.

Objective of the cruise was to investigate the section of Area VI contiguous to that portion of Area V where concentrations of surf clams had been found previously.

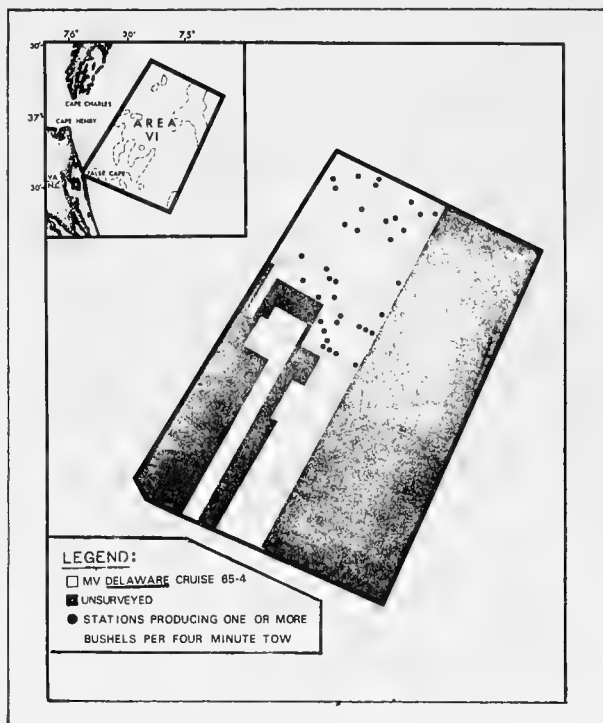
Of the 735 stations occupied, 36 tows were made where the catches from the standard 4-minute tow equaled 1 or more bushels. From those 36 tows, the largest catch was 8.9 bushels. Of the remaining 699 tows, 365 produced clams in amounts less than 1 bushel, and 334 tows none. Of the 699 tows, 365 produced some clams while the remaining 334 tows yielded no clams.

**SURVEY PROCEDURES:** The same procedure was followed during this cruise as during past clam surveys. Samples were taken at each survey station with a 48-inch hydraulic dredge. Each sample consisted of the catch from either a 2- or 4-minute tow (depending on the type of bottom) made at the intersection of grid lines spaced 1 mile apart. Operations began at the northern end of the grid line which forms the western boundary of Area VI and proceeded from that point to other parts of the area. Stations occurring in the vicinity of the many wrecks charted in the area were bypassed.

**SURF CLAM CATCHES:** In the sections of Area VI surveyed, the best concentrations of surf clams were found within a roughly rectangular-shaped plot extending from its northern boundary south to its center (see chart). In the central portion of that plot, however, only one tow was made where the catch exceeded one bushel; south of the rectangular-shaped plot, within the inshore segments surveyed, none of the tows produced more than one bushel of clams.

In the central section of Area VI, just south of the above described rectangular plot, me-

dium clams ( $2\frac{1}{2}$  to  $4\frac{1}{2}$  inches long) made up almost all of the surf clam populations; those could possibly be the results of one year's spawning. South of that section, and all of the way to the southern boundary of Area VI, only an occasional catch of 1 or 2 surf clams per tow was taken.



Surf Clam Area VI and producing stations during M/V Delaware cruise 65-4 (May 3-June 3, 1965).

The best concentrations of surf clams in Area VI occurred in sections where the bottom was composed mostly of coarse sand, gravel, or sand and gravel mixed. Most of the poorer catches were made where the bottom was predominantly mud, clay, or mud and clay. However, many poor catches did occur in sandy bottom sections throughout the area. In the lower central section of Area VI, many spots of gravel or sand and gravel were found, although they failed to produce any surf clams.

In Area VI the best catches of surf clams were made in depths of water between 17 and 19 fathoms with some good catches occurring as shallow as 13 fathoms and as deep as 20 fathoms.

**SIZE OF SURF CLAMS:** All sizes of clams were taken except the very smallest (the clam

dredge used was not designed to take very small clams). As in previously surveyed areas, the predominant size group taken was 5 inches or more in length. Medium surf clams made up the bulk of many of the tows from the area. Few clams less than 1.5 inches were taken during the cruise.

Surf clam shells, along with those of other shellfish species, were taken at most of the stations surveyed. The abundance of shells varied from several shells up to 15 bushels per tow. Considerable numbers of shells were present along with live clams in most of the productive tows; only a few tows were made where the catch sample consisted entirely of live clams. Some tows produced crushed mollusk shells along with other bottom material.

**BLACK QUAHOGS:** Small quantities of black quahogs were found in many catches at scattered points throughout Area VI, but they never occurred in amounts equal to those found during the survey of other areas. One or 2 were frequently taken in a tow along with surf clams; the quahogs seldom occurred by themselves. Very few shells of that species were taken in the area.

**CONTINUATION OF THE SURVEY:** Summer and fall clam survey cruises were scheduled for August 30 to September 11 and September 29 to October 15, 1965.

Note: See Commercial Fisheries Review, June 1965 p. 28.

\* \* \* \* \*

#### TRAWL GEAR EVALUATIONS:

M/V Delaware Cruise 65-5 (June 14-June 25, 1965): The objectives of this cruise were to: (1) measure the in-use dimensions of four trawls of special interest to the east coast fishing industry, and (2) fish two of the trawls comparatively under similar conditions.

**MEASUREMENT OF IN-USE DIMENSIONS:** The measurements were made with a "sonic" system developed during Delaware Cruises 63-2 and 63-3. The system utilizes echo-sounding transducers mounted on the wings and headrope of the trawl and connected electrically to a sounding machine (fig.). Two traces are printed simultaneously on the recorder. Those traces represent (1) the distance between the center of the headrope and the bottom, and (2) the distance between the wing ends.

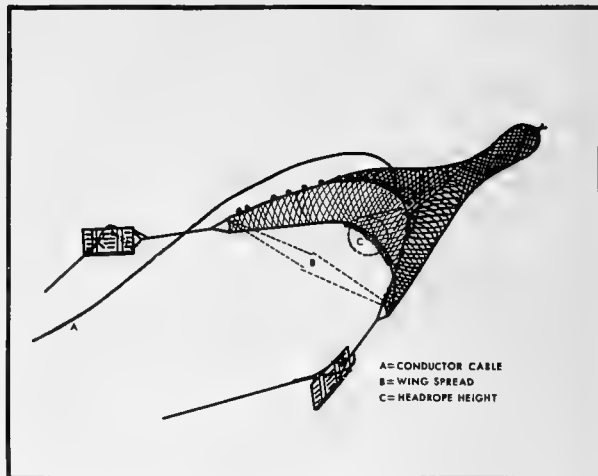


Diagram of otter trawl as rigged for measuring horizontal and vertical openings during fishing operations. Note location of transducers and cables used in "sonic" trawl measuring and telemetering system.

The four nets measured were: (1) a No. 41 otter trawl of No. 54 braided nylon through-out (exclusive of cod end), rigged with 16-inch wooden roller gear; (2) a Skagen type "S" deep-sea wing trawl of polyethylene twine, rigged with 20-inch rubber roller gear; (3) a French Granton trawl of manila and polypropylene twine, rigged with 20-inch rubber roller gear; and (4) an Atlantic western trawl, Model III, of polyethylene twine, rigged with 20-inch rubber roller gear. All cod ends were No. 102 braided nylon. The Atlantic western trawl was fished with oval B.M.V. otter boards weighing 2,200 pounds each and measuring 10 feet 4 inches by 5 feet 10 inches. The other 3 nets were fished with rectangular otter boards weighing 1,250 pounds each and measuring 10½ feet by 4½ feet.

Trials were carried out on the northern edge of Georges Bank in water 27 fathoms deep. Tests with each trawl were made at three speeds, with two ratios for warp-length to depth, and in four directions. The nets were towed with, against, and across the tidal current to minimize the current's effect upon the average measurements for headrope height and wing spread.

The dimensions of each net varied widely due to changes in warp-length, speed, and tidal current. Generally, any factor causing the wing spread to increase would result in a corresponding decrease in headrope height. The largest single variable influencing wing spread was the towing warp-to-depth ratio.

Table 1 - Comparison of Extremes of Wing Spreads and Headrope Heights During Tows

Trawl	Measurement	Warp-to-Depth Ratio	Engine Speed	Wing Spread	Headrope Height
			(r. p. m.)	(feet)	(feet)
No. 41	Max. headrope	3:1	200	52	14
	Min. headrope	4:1	200	50	9
	Max. wing spread	4:1	210	54	9
	Min. wing spread	3:1	200	44	12
Skagen	Max. headrope	3:1	200	36	23
	Min. headrope	4:1	200	51	9
	Max. wing spread	4:1	210	52	9
	Min. wing spread	3:1	200	36	23
Granton	Max. headrope	3:1	210	38	22
	Min. headrope	4:1	190, 200, 210	50	10
	Max. wing spread	4:1	210	56	12
	Min. wing spread	3:1	200	34	20
Atlantic Western	Max. headrope	2.5:1	210	36	30
	Min. headrope	4:1	210	50	10
	Max. wing spread	3:1	190	56	18
	Min. wing spread	2.5:1	200	36	30

A 4:1 ratio caused the maximum wingspread in this series. Maximum headrope heights were obtained at a 3:1 ratio, with a sacrifice of wing spread (table 1).

Average headrope height and wing spread of the No. 41 trawl as measured during the cruise were 10 feet and 48 feet, respectively. Those figures do not represent the optimum configuration of the net, but an average of the measured heights and of measured spreads for all combinations of warp length, speed, and tide. For the other trawls measured, the average dimensions were as follows (for headrope height and wing spread): Skagen trawl--18 feet and 44 feet, Granton trawl--15 feet and 42 feet, Atlantic western trawl--20 feet and 42 feet.

The Atlantic western trawl had an average headrope height of twice that of the No. 41 and an average wing spread of 6 feet less. The Granton and the Skagen had headrope heights of 5 feet and 8 feet greater than the No. 41 and wing spreads of 6 feet and 4 feet less than the No. 41, respectively. (It is interesting to note that the nylon No. 41 trawl used during this cruise had an average headrope height of from 2.5 to 3 feet greater than that of the No. 41 manila trawl used in previous measurement work.)

COMPARATIVE FISHING--ATLANTIC WESTERN VS. NO. 41 TRAWL: The second phase of the cruise was designed to study the relative catching efficiency of the Atlantic western trawl as compared to the No. 41 trawl. A towing schedule was set up to equate the number of tows of each net for each period of daylight and darkness. Three or 4

tows in succession were made with one trawl before changing to the other trawl on the opposite side of the vessel. All tows were of 1-hour duration. The Atlantic western trawl was towed at 210 r. p. m. with a warp-to-depth ratio of 3:1. The No. 41 trawl was towed at 200 r. p. m. with a 3:1 warp-to-depth ratio. The optimum dimensions of the net, as determined earlier in the cruise, occurred at those speeds and warp ratios. The dimensions of the Atlantic western trawl were headrope height 25 feet and wing spread 43 feet. Corresponding dimensions of the No. 41 trawl were 12 feet and 50 feet. The Atlantic western trawl was rigged with 15-fathom legs and the No. 41 utilized legs of 5 fathoms. Ground cables of 10-fathom length were used with each net.

Table 2 - Catch Ratios--Advantage of Atlantic Western Over No. 41 Trawl By Species

Species	Day	Night	Day & Night Combined
	..... (Catch Ratio <sup>1/</sup> ) .....		
Haddock .....	1.4	2.2	1.7
Cod .....	2.7	8.0	4.2
Flounders .....	12.5	2.3	4.5
Skate .....	8.1	3.4	3.9
1/Catch ratio = $\frac{\text{Total pounds in Atlantic western trawl}}{\text{Total pounds in No. 41 trawl}}$			

Areas fished included the Northern Edge, Winter Fishing grounds, Bight of Clarks, the Channel area, and Pollack Rip area, all of which are on Georges Bank or adjacent to it.

On the basis of 40 tows for each net, the combined catch of all species for the Atlantic western trawl was about  $2\frac{1}{2}$  times that of the No. 41. The catch advantage for selected species is indicated in table 2.

In evaluating the data, notice must be taken of various factors which might bias the results. Although the gear appeared to be fishing satisfactorily, further tests may reveal the need for minor adjustments in either the rigging of the net or the doors to improve the efficiency of the trawls. Fish were fairly scarce during the trial period; the average catch per 1-hour tow was about 400 pounds total for the species listed in table 2. Also, because of the limited time available, not all types of bottom were fished.

No significant problems were encountered in handling the Atlantic Western trawl. The oval trawl doors were set out without difficulty, and no more time was required to handle either the net or the doors than is usual with a No. 41 trawl. Neither net suffered extensive damage during the trials. Tear-ups were limited to the wing ends in each trawl.

Additional field work is being planned to further evaluate the Atlantic Western trawl

and the other two trawls measured during the cruise.

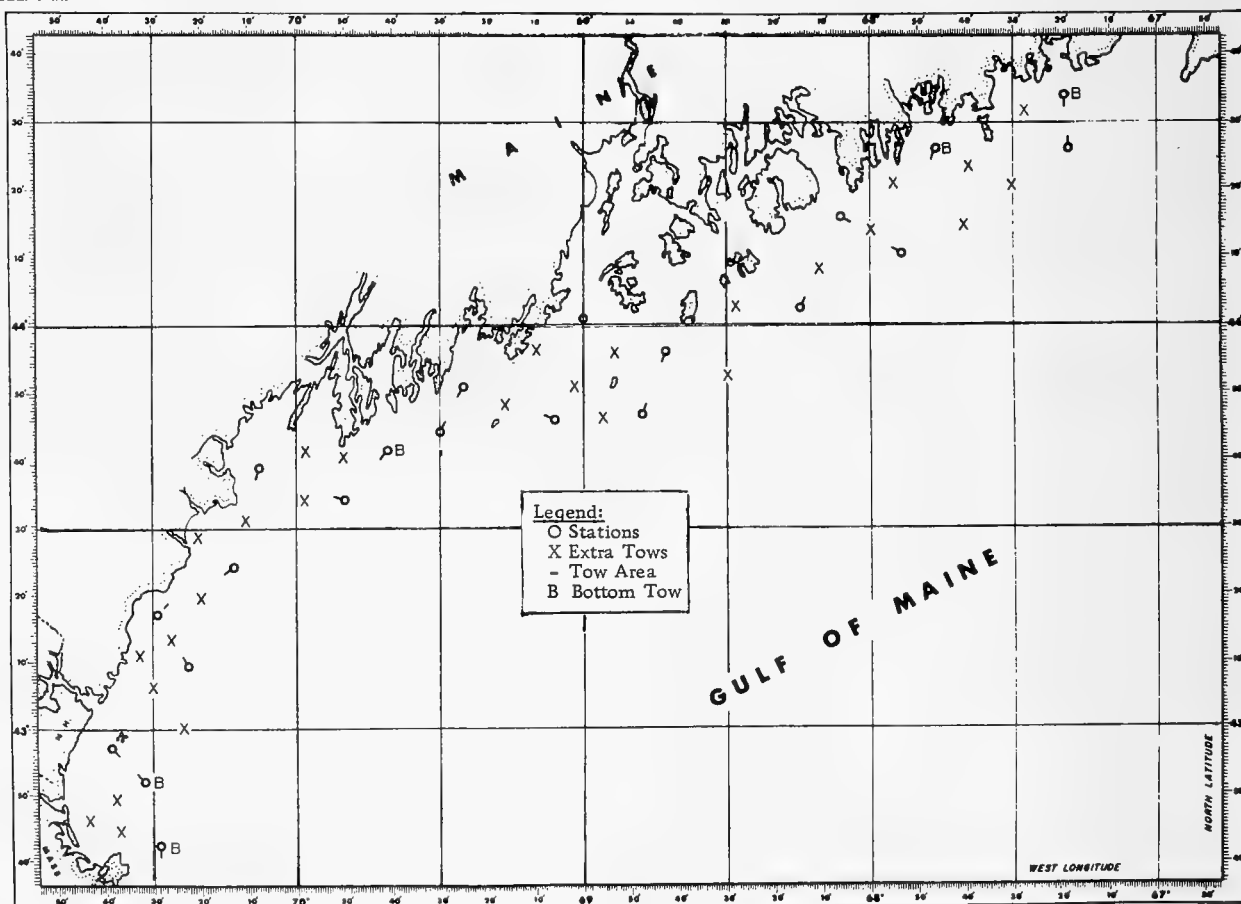
Note: See Commercial Fisheries Review, Nov. 1963 p. 37 and June 1963 p. 37.



## North Atlantic Fisheries Investigations

### SPRING DISTRIBUTION OF HERRING LARVAE STUDIED:

M/V "Rorqual" Cruise 3-65 (May 11-21, 1965): To determine the spring distribution of herring larvae along the coast of the Gulf of Maine, and to compare the catches of herring larvae at routine sampling stations with those in areas not previously sampled were the objectives of this cruise by the research vessel Rorqual, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Boothbay Harbor, Me. The area investigated was between Grand Manan Channel and Cape Ann.



Shows area of operations during M/V Rorqual cruises 3-65 and 4-65 (May 1965).



**BIOLOGICAL OBSERVATIONS:** Thirty-minute oblique hauls were made at 21 stations routinely sampled, and at 28 additional positions located between them. Horizontal hauls were made at the surface and at 10 and 20 meters (32.8 and 65.6 feet), and bottom in the Saco Bay area to determine the vertical distribution of herring larvae. Except for 5 tows in the Machias area where the Boothbay Depressor No. 1 trawl was used, samples were collected with the larger Boothbay Depressor No. 2 trawl. A single oblique tow with the Gulf III trawl was made in Grand Manan Channel.

The oblique trawl tows yielded 12,407 fish larvae of which over 7,000 were herring larvae. Individual catches of herring larvae varied from 0 at a number of stations near Cape Ann to 2,046 in Saco Bay. Larvae were present at most of the stations sampled, and some of the areas that were not sampled routinely had good catches. The horizontal tows in the Saco Bay area showed that herring larvae were concentrated from the surface to 10 meters; perhaps fewer than 9 percent of the 904 larvae taken were from 20 meters and from the bottom at 45 meters (147.6 feet). Other fish larvae had a similar distribution and only one-third of the 1,397 taken were from those depths. The size range of herring larvae extended from 22 to 45 millimeters (0.9 to 1.8 inches). The size modes varied between stations but usually were positioned from 30 to 35 meters (98.4 to 114.8 feet). No herring were recorded on the echo-sounder.

**HYDROGRAPHIC OBSERVATIONS:** The thermograph recorder was run throughout the cruise and surface salinity and temperature was sampled at each station. Five sea-bed drifters and surface drift bottles were released at each station. Nansen bottle and bathythermograph casts were made in Grand Manan Channel.

**M/V "Rorqual" Cruise 4-65 (May 21-26, 1965):** To sample larval herring and hake environmental measurements at selected stations in the coastal areas of the Gulf of Maine was the objective of this cruise by the Rorqual. The area investigated was between Machias Bay and Cape Ann within the 50-fathom line.

**BIOLOGICAL OBSERVATIONS:** Oblique hauls with the Boothbay Trawl No. 1 were made at 21 stations from 20 meters to the surface at 18 stations and from the bottom to the surface at 3 stations in the central-eastern cruise sector. Oblique Gulf III trawl tows were made from 20 meters to the surface at 12 coastal continuity stations.

A total of 140 herring larvae were taken at 15 of the 21 stations in the trawl. As in the Rorqual's previous cruise, no larvae were taken in the vicinity of Cape Ann, and the size range of larvae from other stations was 24-45 millimeters (0.94-0.98 inches). The catch per unit of effort was half that of the previous cruise at stations routinely sampled. Only 13 larvae were taken in the Gulf III trawl. Surface temperatures ranged from 39.8° F. in the Machias Bay area to 55.2° F. at Cape Ann. A thermocline was present in the waters from Cape Ann to Penobscot Bay. No herring were recorded on the echo-sounder.

**HYDROGRAPHIC OBSERVATIONS:** Nansen bottle casts, bathythermograph casts, and photometer and secchi disc readings were made at each station. Five sea-bed drifters and 5 surface drift bottles were released at each station.

Note: See Commercial Fisheries Review, August 1965 p. 46.

\* \* \* \* \*

#### **RECORD DOGFISH CATCH OBTAINED IN SINGLE TOW:**

Each groundfish survey cruise conducted by research vessels of the U. S. Bureau of



A big haul of spiny dogfish by a U.S. Bureau of Commercial Fisheries research vessel.

Commercial Fisheries Biological Laboratory, Woods Hole, Mass., occupies around 200 trawl stations. The catches of fish vary in size from a few pounds to 1 or 2 tons. On one of those cruises in April 1965, over 12,000 pounds of dogfish were taken during a single one-half hour tow. That catch, made by the Bureau's research vessel Albatross IV south of Nantucket in a depth of 100 fathoms, was the largest ever made by the vessel, and severely strained Bureau biologists who are responsible for measuring everything that is taken by the net on survey cruises. However, effective subsampling techniques were quickly used to handle the catch. It was noted that no sign of fish had appeared on the fish finder during the tow.



## North Pacific Fisheries Explorations and Gear Development

### HAKE POPULATION SURVEY CONTINUED:

Simulated commercial fishing for Pacific hake (Merluccius productus) for 100 days is the purpose of cruise 6 by the vessel Western Flyer. Chartered for exploratory fishing by the U. S. Bureau of Commercial Fisheries, the vessel left Seattle July 16, 1965, to fish off the coast of Washington, Oregon, and California.

Major objective of the cruise is to determine the commercial production potential of Pacific hake when fished with the experimental "Cobb" pelagic trawl and accessory equipment. Other objectives include the collection of data such as: (1) economic factors related to commercial exploitations; (2) ruggedness and reliability of experimental gear; (3) catch rates in time and space; (4) analysis of catching technique and fishing methodology; and (5) relative effectiveness of various loading and unloading methods and procedures (splitting, speed brailing, pumping, etc.).

The vessel will operate from a shore-based reduction plant. Nearby hake schools (located during prior explorations) will be fished to determine sustained production capability. Catches will be delivered to a commercial fish reduction plant when possible.

The gear to be used during the production trials include: (1) experimental "Cobb" pe-

lagic trawls; (2) aluminum hydrofoil-type otter boards; (3) electrical towing cable; (4) dual electrical depth-telemetry system; and (5) high-resolution "white-line" type echosounder.

Note: See Commercial Fisheries Review, August 1965 p. 47.



## Oceanography

### COAST GUARD CUTTER "NORTHWIND" TO STUDY NORTHERN WATERS:

The U. S. Coast Guard cutter Northwind left New York City on June 27, 1965, for a five-months oceanographic study to expand world knowledge of far northern waters. A good part of the expedition will be in northern waters which are relatively unexplored with marine studies scheduled in the Kara and Barents Seas north of Russia. It is expected that the expedition will supply extensive data about those important, but little known waters.



U.S. Coast Guard cutter (269 feet long) Northwind.

Marine scientists of the Coast Guard's Oceanographic Unit will carry out a variety of programs dealing with physical oceanography, geology, and geophysics, hydroacoustics, ice reconnaissance, and biology. To monitor boundary conditions affecting the circulation between the North Atlantic Ocean and the Arctic Basin, the marine researchers will carry out a physical oceanographic survey from the southern tip of Greenland to Iceland, and then on to Scotland. The scientists will occupy 23 stations and their measurements will include temperature, salinity, dissolved oxygen, and water color and transparency determinations.

Working closely with the cutter Northwind, and carrying out similar programs in the Arctic Seas will be scientists of the U. S. Naval Oceanographic Office, the University of Wisconsin, the Office of Naval Research, and the Smithsonian Institution.

This multipronged investigation of far northern waters should yield a profile of the areas studied never before available to the world's oceanographic community. As a result of the study, scientists for the first time will have important information on the nature, structure, and history of the immense Eurasian Continental Shelf. The study could shed new light upon the origin of the earth itself. Representative biological life also will be collected on the expedition.

\* \* \* \* \*

**PROPOSED "SEA-GRANT" COLLEGES  
TO BE DISCUSSED AT  
UNIVERSITY OF RHODE ISLAND  
CONFERENCE, OCTOBER 28-29, 1965:**

A national conference to develop plans and ideas for implementing the concept of "sea-grant" colleges will be held at the University of Rhode Island on October 28 and 29, 1965. The 2-day session will be held in conjunction with a meeting of the National Academy of Sciences Committee on Oceanography.

Among the featured speakers will be the dean of the Institute of Technology, University of Minnesota, who is credited with originating the idea. He believes that "sea-grant" colleges should be established in existing universities as "modernized parallels of the developments in agriculture and the mechanic arts which were occasioned by the land grant act of about a hundred years ago. . . . The same kind of imagination and foresight could be applied to exploitation of the sea."

Under the Morrill Land Grant Act of 1862, all the States were allocated Federal land to establish a college where the "leading object shall be. . . to teach such branches of knowledge of learning as are related to agriculture and the mechanic arts. . . ." While Federal lands are not available today for such a purpose, it was suggested, for instance, that some of the funds the U. S. Government receives from the lease of undersea lands might be allocated to "sea-grant" colleges.

Also participating in the meeting on "sea-grant" colleges will be Senator Claiborne Pell

of Rhode Island who said he intends "within a short time" to introduce legislation concerning "sea-grant" colleges. Other educators, scientists, and Congressmen will be invited to take part in the sessions. (University of Rhode Island, Kingston, R. I., July 15, 1965.)



## Salmon

### U. S. PACIFIC COAST CANNED STOCKS, JULY 1, 1965:

On July 1, 1965, canners' stocks (sold and unsold) in the United States of Pacific canned salmon totaled 733,575 standard cases (48 1-lb. cans)--218,069 cases less than on June 1, 1965, when stocks were 199,236 cases less than on May 1, 1965.

On the basis of a total of 858,116 actual cases (consisting of cans of  $\frac{1}{4}$ -lb.,  $\frac{1}{2}$ -lb., 1-lb., etc.), pink salmon accounted for 46.5 percent (399,169 cases of which 326,096 cases were 1-lb. talls) of the total canners' stocks on July 1, 1965. Next came chum (262,259 cases, mostly 1-lb. talls), followed by red (109,129 cases). The remainder of about 10.2 percent was coho (silver) and king salmon.

Table 1 - Total Canners' Stocks of Pacific Canned Salmon,  
July 1, 1965

Species	July 1, 1965	June 1, 1965	May 1, 1965
. . . . . (No. of Actual Cases). . . . .			
King	24,850	30,336	39,645
Red	109,129	180,128	227,847
Coho	62,709	73,724	87,255
Pink	399,169	515,796	654,421
Chum	262,259	331,956	373,892
Total	858,116	1,131,940	1,383,060

Carryover stocks at the canners' level totaled 1,175,588 standard cases on July 1, 1964, the approximate opening date of the Pacific salmon packing season. Adding the 1964 new season pack of 3,922,356 standard cases brought the total available supply for the 1964/65 season to 5,097,944 standard cases.

Shipments during June 1965 totaled 218,069 standard cases. Shipments at the canners' level of all salmon species during sales year from July 1, 1964, to July 1, 1965, totaled 4,364,369 standard cases. That resulted in a carryover of 733,575 standard cases on July 1, 1965, the beginning of the 1965/66 sales year, substantially lower (37.6 percent) than the 1,175,588 cases a year earlier.

Table 2 - Total Cannery Stocks on Hand July 1, 1965 (Sold and Unsold), By Species and Can Size

Case & Can Size	King	Red	Coho	Pink	Chum	Total
	(Actual Cases)					
48 $\frac{1}{4}$ -lb. ....	1,749	33,200	8,782	1,115	22	44,868
48 $\frac{1}{2}$ -lb. ....	20,159	58,909	12,668	68,304	21,741	181,781
48 1-lb. ....	2,856	17,009	39,786	326,096	231,483	617,230
12 4-lb. ....	86	11	1,473	3,654	9,013	14,237
Total .....	24,850	109,129	62,709	399,169	262,259	858,116

Table 3 - Cannery Shipments From July 1, 1964 to July 1, 1965, By Species and Can Size

Case & Can Size	King	Red	Coho	Pink	Chum	Total
	(Actual Cases)					
48 $\frac{1}{4}$ -lb. ....	22,498	394,732	113,910	10,566	1,422	543,128
48 $\frac{1}{2}$ -lb. ....	116,683	628,185	41,707	535,164	136,350	1,458,089
48 1-lb. ....	19,265	481,045	128,723	2,071,828	647,124	3,347,985
12 4-lb. ....	330	4,939	20,017	95,743	30,529	151,558
Total .....	158,776	1,508,901	304,357	2,713,301	815,425	5,500,760

The new 1965 season Alaska salmon pack totaled 2,219,299 standard cases (includes 171,859 cases of pink salmon) as of July 25, 1965. That compared with 1,585,951 cases on July 26, 1964. Most of the new pack consisted of red salmon packed at canneries in central and western Alaska.

Data on canned salmon stocks are based on reports from U. S. Pacific Coast canners who packed over 96 percent of the 1964 salmon pack. (Division of Statistics and Economics, National Cannery Association, July 26, 1965.)

Based on data submitted to the U. S. Bureau of the Census by a sample of wholesalers and warehouses of retail multiunit organizations, distributors stocks of salmon were estimated at 584,000 actual cases on July 1, 1965, and 671,000 actual cases on June 1, 1965. Data on distributors stocks for previous months are not available.



## Shrimp

### BREADED PRODUCTION, JANUARY-MARCH 1965:

United States production of breaded shrimp during the first quarter of 1965 amounted to about 21.3 million pounds--a decrease of about 1.4 million pounds or 6.1 percent as compared with the same period in 1964.

Table 1-U. S. Production of Breaded Shrimp by Months, 1964-65

Month	1/1965	1964
	.. (1,000 Lbs.) ..	
January .....	6,901	7,347
February .....	6,613	8,045
March .....	7,742	7,249
April .....	-	7,027
May .....	-	6,171
June .....	-	6,588
July .....	-	8,641
August .....	-	7,299
September .....	-	7,830
October .....	-	9,169
November .....	-	7,852
December .....	-	7,460
Total .....	-	90,678
1/Preliminary.		

Table 2 - U. S. Production of Breaded Shrimp by Areas, January-March 1965

Area	1/Jan.-Mar. 1965		Jan.-Mar. 1964	
	No. of Plants	Quantity 1,000 Lbs.	No. of Plants	Quantity 1,000 Lbs.
Atlantic .....	17	7,167	14	6,415
Gulf .....	18	12,420	19	14,407
Pacific .....	7	1,669	8	1,819
Total .....	42	21,256	41	22,641
1/Preliminary.				

The Gulf States ranked first in the production of breaded shrimp with 12.4 million pounds, followed by the Atlantic States with 7.2 million pounds, and the Pacific States with 1.7 million pounds.

Note: See graph on p. 23 of this issue; also *Commercial Fisheries Review*, May 1965 p. 36, Jan. 1965 p. 47.



## South Atlantic Fisheries Explorations and Gear Development

### FISHERY RESOURCE POTENTIALS IN SOUTHERN BAHAMA AREA EXPLORED:

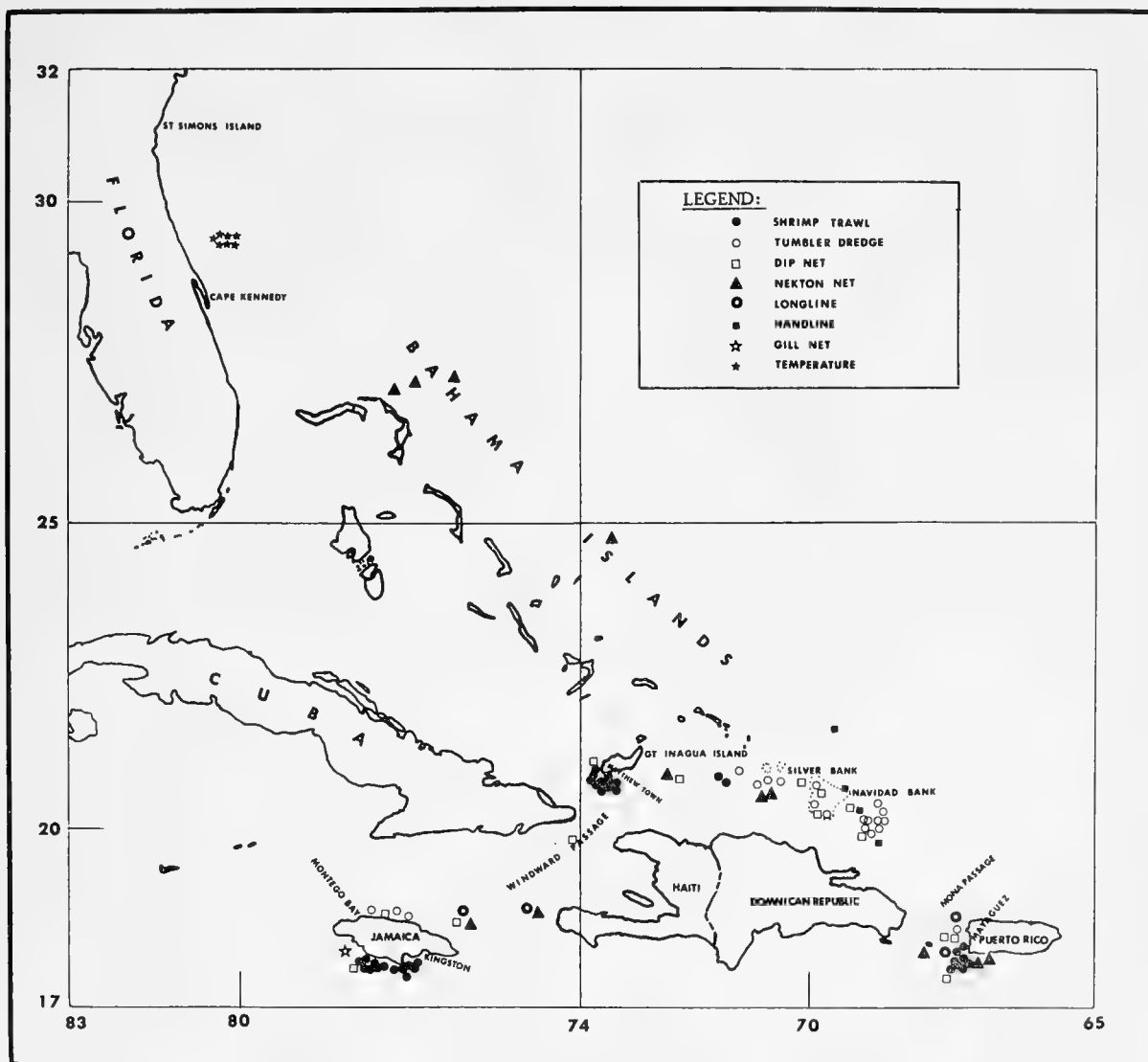
M/V "Oregon" Cruise 101 (May 10-June 17, 1965): A 40-day cruise in the southern Bahamas, Windward and Mona Passages, and along the southwest, west, and north coasts of Jamaica was completed June 18, 1965, by the exploratory fishing vessel Oregon of the U. S. Bureau of Commercial Fisheries.

Purposes of the cruise were to: (1) obtain a general preliminary idea of the resource

potentials of the little known areas traversed as a part of the overall explorations of the western Atlantic, and (2) cooperate with the United Nations Special Fund Caribbean Program in providing at-sea training to observers from Jamaica and Puerto Rico.

In addition to using trawls, dredges, and long lines, a wide variety of types of gear was used on the cruise to gain a general impression of the relative richness of the fauna, including trolling lines, neuston nets, nekton nets, dip nets, gill nets, and hand lines.

Trawling was made difficult--and in many areas impossible--by the extremely rugged



Shows area of operations during M/V Oregon cruise 101 (May 10-June 17, 1965).

nature of the bottom topography. Only in a few selected areas could trawls be used. Trawling close inshore along the southwest coast of Jamaica yielded moderate catches of small lane snapper (Lutjanus synagris) and very small numbers of pink shrimp (Penaeus duorarum). The sea bottom was smooth, and the only difficulty encountered was with "grass" clogging the net.

Trawling in a depth range of 225-360 fathoms south of Great Inagua Island yielded up to 30 pounds per 30 minutes per 40-foot shrimp trawl of the deep-water queensnapper (Etelis oculatus). Elsewhere the bottom proved to be largely corallaceous--catches were insignificant and gear damage resulted from trials. Dredges were used on the sides and tops of the Caicos Bank, Mouchoir Bank, Silver Bank, and Navidad Bank but heavy growths of coral and larger boulders precluded meaningful catches. Hand lines fished on Silver Bank yielded moderate numbers of large (3- to 4-pound) yellowtail snappers (Ocyurus chrysurus).

Two 50-basket long-line sets were made at night in the Windward Passage, just off the edge of the Continental Shelf. No swordfish were caught. Two big-eyed tuna (Thunnus obesus) were taken on the second set. Four swordfish ranging in size from 75 to 150 pounds were taken during three 50-basket night sets made off Mona Island in Mona Passage, but fishing was relatively poor, with no tuna appearing on the lines. Three sharks were tagged in conjunction with the Shark Tagging Program of the American Institution of Biological Sciences.

Numbers of small to moderate sized schools of tuna were seen throughout the cruise. They were particularly numerous in the vicinity of Silver Bank. Trolling catches confirmed them to consist largely of blackfin or mixtures of blackfin and either small yellowfin or oceanic bonito (Katsuwonus pelamis). The fish appeared to school by size of individuals as much as by species composition.

\* \* \* \* \*

#### NEW FISHERY RESEARCH VESSEL FOR U. S. BUREAU OF COMMERCIAL FISHERIES:

The award of a \$1,990,000 contract to a Pascagoula, Miss., shipyard for building an exploratory fishing vessel was announced July 8, 1965, by the U. S. Department of the Interior.

The new vessel will be assigned to the Department's Bureau of Commercial Fisheries Exploratory Fishing Base in Pascagoula. The vessel is designed especially for operation in tropical waters and will play an important part in the Bureau's Tropical Atlantic Oceanography Program. This program is international in scope, involving the cooperative efforts of many countries, and requires the best vessels, equipment, and considerable diversity of scientific skills.

Primary function of the vessel will be to determine the distribution and abundance of the many fish and shellfish resources of the Gulf of Mexico and the Caribbean.

Specifications call for a 170-foot vessel displacing 906 tons, driven by two 800-hp. diesel engines at a speed of 14 knots. It will be manned by a crew of 14 and have additional quarters and facilities for 11 scientists. The contract calls for completion within two years. The new vessel will be able to cruise up to 9,000 miles and will carry a wide array of scientific gear, including accoustical and electrical devices, for assessing the fishery resources of an area. Its size and seaworthiness will permit fishing operations in relatively heavy seas and under adverse weather conditions.

The Bureau of Commercial Fisheries has three other research vessels under construction. The David Starr Jordan was launched in December 1964 and was being fitted at Sturgeon Bay, Wis.; the Miller Freeman, being built in Lorain, Ohio; and another vessel being built at South Portland, Me., to replace the Bureau's exploratory fishing vessel Delaware.

Note: See Commercial Fisheries Review, February 1965 p. 45; August 1964 p. 44.



## South Carolina

### FISHERIES BIOLOGICAL RESEARCH PROGRESS, APRIL-JUNE 1965:

A report on the progress of biological research by the Bears Bluff Laboratories, Wadmalaw Island, S. C., for April-June 1965, follows:

Oyster Studies: Several synthetic dyes were tested to find one which would be suitable for bulk marking of intertidal oysters in situ. One dye could be detected coloring the



shells of oysters for 14 days in shallow areas. However, where the oysters were exposed to wave action retention time was reduced considerably and marking of oysters thus was not practical. This study will continue in hopes of finding a long-lasting marker which can be sprayed on intertidal oysters growing on the beds.

Studies on the general condition of oysters from several areas in the State were continued. Measurements to show the relationship between the internal volume of the oyster shell and the weight of the meat of the oyster were used to determine the condition factor. Fluctuations throughout the State were great, ranging from a low of 3.1 near Charleston Harbor to a high of 12.5 in Bull Bay. Pond-grown oysters at Bears Bluff were 9.8 to 9.9. These studies continue in the July-September quarter when an expanded program of sampling of oysters throughout the State is planned.

Test shells hung beneath the docks at Bears Bluff indicated that oyster spat began to set about May 19 and followed the general pattern of spatfall for South Carolina waters.

**Shrimp Studies:** Postlarval brown shrimp, *Penaeus aztecus*, which began to enter coastal waters in late January of this year, continued to recruit in good numbers through mid-April. These postlarvae were more plentiful in experimental tows during 1965 than in 1964, indicating a somewhat greater commercial catch for this species in June-August. By mid-April of this year many of those shrimp were  $1\frac{1}{2}$ -2 inches in length, and by mid-May they averaged  $2\frac{1}{2}$ -3 $\frac{1}{2}$  inches. In mid-late June the average length was 4-5 inches, heads on, and some had reached commercial size and were beginning to appear on the shrimp grounds. The number of brown shrimp caught in each experimental trawl averaged two times as many during April-June of this year as compared with 1964 (table).

Average Catch Per Unit of Effort at Regular Survey Stations, 1962-1965 (April-June)						
Year	Croaker	Spot	Blue Crabs		White Shrimp	Brown Shrimp
			Immat.	Mat.		
1965	71.4	25.8	13.9	9.5	8.3	21.7
1964	151.9	65.6	15.6	29.3	-0.1	10.8
1963	146.8	42.9	12.9	18.6	0.02	34.2
1962	176.9	107.6	14.9	25.0	16.7	92.9

A good run of spawning white shrimp, *Penaeus setiferus*, occurred along the coast this spring. Mild water temperatures during the past winter, coupled with the fact that a con-

siderable population of white shrimp wintered over in coastal waters, probably was responsible to a great extent for the roe shrimp success this year. The majority of white "roe" shrimp appeared to spawn in early and mid-May, and postlarval white shrimp began to show up in plankton tows in mid-May. These small shrimp were extremely abundant during late May and early June. To date, the postlarvae have been over ten times more numerous than during the same period in 1964, and the outlook for the commercial catch of white shrimp this year is greatly improved. By late June, postlarval white shrimp entering inside waters began to decline in numbers, but a second peak of abundance may occur in July. Whether this occurs or not, the outlook is many times improved over 1963-64, and a considerable early run of white shrimp should take place in August or September.

Although both white and brown shrimp increased in abundance during April-June of this year as compared with last year, many other species of fish and shellfish declined in experimental trawl catches. Spot were less than half as numerous this year as in 1964, and croaker showed a similar decrease in abundance.

**Pond Cultivation:** A number of shrimp cultivation experiments, begun earlier this year, were continued during this quarter. Two one-acre ponds are being stocked with both brown and white shrimp, including postlarvae and juveniles. One of those ponds was stocked naturally with postlarvae by flooding from the nearby creek. The other pond was stocked with postlarvae and juvenile shrimp collected by plankton net and cast net. Both ponds will be harvested in the fall of the year. A  $\frac{1}{10}$ -acre pond was stocked entirely with postlarval brown shrimp collected by plankton nets in February and March. The shrimp in that pond are being fed heavily with chopped crabs in an effort to learn more about shrimp growth rates and maximum productivity of ponds.

All shrimp ponds were treated with rotenone in April and May to remove unwanted fishes. Crab pots are being used in the ponds to control those predators.

Several experiments, using 12 x 12 foot concrete tanks stocked with postlarval shrimp, were continued or initiated during this quarter. Two of the tanks were stocked heavily with postlarval brown shrimp to study growth

rates in controlled conditions. One tank has been stocked with plankton collections containing white shrimp postlarvae as well as many blue crab (*Callinectes sapidus*) larvae. The purpose of this experiment is to determine whether crab larvae can survive pond conditions, and if so what effects they have on young shrimp.

Experiments on artificial breeding of white shrimp were carried out during May and June. Several white "roe" shrimp in spawning condition were induced to spawn in tanks, and in one case a number of eggs were hatched. Although the young shrimp survived only a few hours after hatching in this experiment, the results were encouraging.

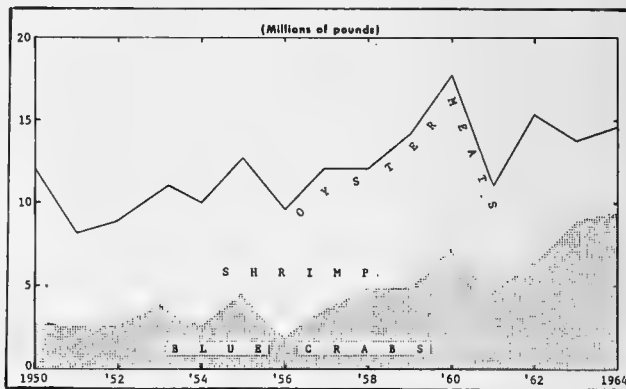
**Fish Kill:** Beginning May 21, 1965, another fish kill occurred in the Ashley River. It was first reported to Bears Bluff Laboratories by National Park Service personnel who noticed and collected dead and dying mullet around Fort Sumter in Charleston Harbor. Although most of the dead fish noted in the river were menhaden, inspectors of the State's Division of Commercial Fisheries also found spot, mullet, and 1 or 2 shrimp. The kill was investigated by the S. C. Water Pollution Control Authority. It continued sporadically through the end of June. In June, the U. S. Public Health Service sent in a team of investigators from Cincinnati, Ohio, and another from Athens, Ga. Bears Bluff Laboratories cooperated with them in every way and the research boat *Anita* was used to collect fish. Two trips were made to areas far removed from the Ashley River to secure control specimens, and two trips were made in the Ashley River where repeated trawling produced a large number of abnormal-appearing discolored menhaden and croaker, which were given to the Public Health Service.

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#### FISHERY LANDINGS AND TRENDS, 1964:

Landings of fish and shellfish at South Carolina ports during 1964 were 21.7 million pounds valued at \$3.0 million--a decrease of 1 percent in quantity and 7 percent in value from 1963. Leading species during 1964 were blue crab 9.4 million pounds, spot 3.2 million pounds, shrimp 2.6 million pounds (heads-on), and oyster meats 2.5 million pounds. Those 4 species made up 82 percent of the year's total catch.

Blue crab landings were at a record level for the second straight year. Ex-vessel crab prices ranged from 3 to 5 cents a pound in 1964. With a firm market for crab meat, nearly all picking plants in South Carolina worked to capacity. Crab fishermen tended to shift to the use of pots and traps, rather than trot lines.



South Carolina landings of crabs, shrimp, and oysters, 1950-1964.

Shrimp landings were up 20 percent from 1963, but were far below the average catch of 5 to 7 million pounds of recent years. The average ex-vessel price for shrimp in 1964 was 33 cents a pound (heads-on weight), an increase of 4 cents from the previous year.

The production of oyster meats in 1964 totaled 2,511,071 pounds valued at \$996,969, as compared with 3,827,078 pounds valued at \$1,556,451 in 1963.

The catch of food finfish in 1964 was about 5 percent below 1963 due to a poor beach-net fishing season in Horry County during the fall months. Landings were down for flounder, mullet, sea bass, and pompano, but up sharply for catfish, spot, and bluefish.

A series of fish kills occurred in South Carolina waters during the year. On May 15 and for several days thereafter, a heavy kill of fiddler crabs and shrimp occurred back of the Isle of Palms. All evidence indicated that the kill resulted from the use of the chemical BHC in a mosquito abatement program. A very large fish kill took place in the Ashley River and Charleston Harbor beginning on the night of June 21. The causative agent in that kill had not been determined at the close of the year. Another fish kill of much smaller magnitude happened in the Ashley River beginning November 18.



## States' Legislation

### ACTIONS AFFECTING FISHERIES:

Following is a supplemental list of 1965 State laws and resolutions passed by the various State Legislatures which have already adjourned for the year. (Information Letter, National Cannery Association, July 17, 1965.)

**Florida:** H. 2143 provides for uniform laws regulating the seafood and fishing industries in Franklin and Wakulla counties.

**Puerto Rico:** H. 10 annuls the Puerto Rico food, Drug and Cosmetics law of May 1939.



## U. S. Fishing Vessels

### DOCUMENTATIONS ISSUED AND CANCELLED:

U. S. Fishing Vessels 1/--Documentations Issued and Cancelled, by Areas, February, March, April, May 1965										
Area (home port)	February		March		April		May		January-May	
	1965	1964	1965	1964	1965	1964	1965	1964	1965	1964
(Number)										
<b>Issued first documents:</b>										
New England . . . . .	3	1	1	-	4	4	2	7	13	13
Middle Atlantic . . . . .	2	1	-	-	-	1	2	2	5	5
Chesapeake . . . . .	-	-	4	4	3	2	3	7	14	18
South Atlantic . . . . .	5	5	8	6	7	1	4	4	27	21
Gulf . . . . .	24	20	16	13	35	11	29	31	113	92
Pacific . . . . .	9	3	18	4	13	16	30	27	76	53
Great Lakes . . . . .	-	-	1	-	-	-	-	-	1	1
Hawaii . . . . .	-	-	-	-	-	-	-	-	-	-
Puerto Rico . . . . .	-	-	-	-	1	-	-	-	1	-
<b>Total . . . . .</b>	<b>43</b>	<b>30</b>	<b>48</b>	<b>27</b>	<b>63</b>	<b>35</b>	<b>70</b>	<b>78</b>	<b>250</b>	<b>203</b>
<b>Removed from documentation 2/:</b>										
New England . . . . .	5	5	3	2	6	3	3	3	18	14
Middle Atlantic . . . . .	3	1	6	2	-	4	1	-	11	9
Chesapeake . . . . .	4	5	1	1	2	2	6	4	14	16
South Atlantic . . . . .	8	6	6	5	11	4	9	1	41	20
Gulf . . . . .	10	11	13	8	8	13	3	6	40	47
Pacific . . . . .	3	8	10	20	8	19	8	15	37	69
Great Lakes . . . . .	1	-	4	1	1	2	-	1	8	9
Hawaii . . . . .	-	-	-	-	-	-	1	-	2	-
<b>Total . . . . .</b>	<b>34</b>	<b>36</b>	<b>43</b>	<b>39</b>	<b>36</b>	<b>47</b>	<b>31</b>	<b>30</b>	<b>171</b>	<b>184</b>

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.

2/Includes vessels reported lost, abandoned, forfeited, sold alien, etc.

Source: "Monthly Supplement to Merchant Vessels of the United States," Bureau of Customs, U. S. Treasury Department.

**Maine:** H. 94 relates to the license for sardine packers. H. 95 repeals the law regulating the canning of herring. H. 848 repeals the sardine tax on exports. S. 293 repeals the Fish Packing Wage Board Law. S. 526 revises the minimum wage law.

**North Carolina:** H. 560 rewrites the laws relating to the conservation of marine and estuarine and wildlife resources. H. 862 authorizes the State board of health to make and enforce regulations concerning the sanitary aspects of harvesting, processing, and handling shellfish and crustacea, including the power to issue and revoke permits.

**New York:** A. 4320 requires that the State sanitary code shall prescribe procedures for the testing of the atmosphere, potable waters, cultivated soil, plant and animal life grown or raised for food, and all food and food products, to determine the level of radioactivity.



## U.S. Foreign Trade

### IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

United States imports of tuna canned in brine during January 1-July 3, 1965, amounted to 19,159,835 pounds (about 912,400 standard cases), according to preliminary data compiled by the U. S. Bureau of Customs. That was a gain of 7.7 percent from the 17,793,706 pounds (about 847,300 standard cases) imported during January 1-July 4, 1964.

The quantity of tuna canned in brine which can be imported into the United States during the calendar year 1965 at the 12½-percent rate of duty is limited to 66,059,400 pounds (or about 3,145,685 standard cases

of 48 7-oz. cans). Any imports in excess of that quota will be dutiable at 25 percent ad valorem.

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#### AIRBORNE IMPORTS OF FISHERY PRODUCTS, JANUARY-MARCH 1965:

Airborne imports of fishery products into the United States in January-March 1965 to-

U.S. 1/Airborne Imports of Fishery Products, January-March 1965 with Comparative Data				
Product and Origin <sup>2/</sup>	Jan.-Mar. 1965		Jan.-Mar. 1964	
	Qty. 3/	Value 4/	Qty. 3/	Value 4/
	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000
<b>Fish:</b>				
All countries . . . . .	230.6	230.2	108.1	41.4
<b>Shrimp:</b>				
Venezuela . . . . .	4,546.5	2,325.0	1,138.0	466.6
Panama . . . . .	369.6	225.1	249.6	145.2
Costa Rica . . . . .	28.9	14.6	139.9	77.8
El Salvador . . . . .	17.4	13.1	87.1	50.9
Colombia . . . . .	54.1	29.8	-	-
Nicaragua . . . . .	-	-	6.6	4.1
Total shrimp . . . . .	5,016.5	2,607.6	1,621.2	744.6
<b>Shellfish other than shrimp:</b>				
Canada . . . . .	0.6	0.4	1.2	0.9
Mexico . . . . .	0.4	0.3	9.0	4.8
British Honduras . . . . .	54.5	52.0	67.6	47.0
Honduras . . . . .	10.2	4.4	8.4	8.6
Nicaragua . . . . .	70.7	94.0	40.2	30.9
Costa Rica . . . . .	13.9	13.3	9.3	9.5
Jamaica . . . . .	9.5	15.9	32.0	26.2
Other countries . . . . .	95.6	65.7	18.3	6.2
Total shellfish (except shrimp) . . . . .	255.4	246.0	186.0	134.1
Grand total . . . . .	5,502.5	3,083.8	1,915.3	920.1

1/Imports into Puerto Rico from foreign countries are considered to be United States imports and are included. But United States trade with Puerto Rico and with United States possessions and trade between United States possessions are not included.

2/When the country of origin is not known, the country of shipment is shown.

3/Gross weight of shipments, including the weight of containers, wrappings, crates, and moisture content.

4/F.o.b. point of shipment. Does not include U.S. import duties, air freight, or insurance.

Note: These data are included in the overall import figures for total imports, i.e., these imports are not to be added to other import data published.

Source: United States Exports & Imports by Air, FT 785, January, February, and March 1965, U.S. Bureau of the Census.

taled 5.5 million pounds with a value of \$3.1 million. That was more than double the air-borne fishery imports in the first quarter of 1964. The increase was due mainly to larger shipments of shrimp from Venezuela. The imports of shrimp from Venezuela accounted for 83 percent of total airborne fishery imports in January-March 1965.

The data as issued do not show the state of all products--fresh, frozen, or canned--but it is believed that the bulk of the airborne imports consists of fresh and frozen products.

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#### IMPORTS OF FROZEN FISH BLOCKS OR SLABS, 1959-64:

United States imports of frozen fish blocks or slabs (for manufacturing fish sticks and portions) have increased steadily each year since 1959. In 1964, those imports were up 8 percent in quantity and 18 percent in value from the previous year.

The 1964 imports of frozen fish blocks or slabs were nearly double the quantity imported in 1959 and the value was more than double. Despite the greatly increased imports over the past five years, fish blocks have recently been in very short supply. The demand for fish sticks, and particularly fish portions for the institutional trade, has increased greatly and United States producers have been hard pressed for supplies of the raw material. During 1965 the fishblock shortage has been termed almost acute and producers of fish sticks and portions were searching for new sources of raw supplies.

Canada has ranked since 1959 as the principal supplier of frozen fish blocks to the

United States Imports of Fish Blocks or Slabs by Country, 1959-1964

Country	1964		1963		1962		1961		1960		1959	
	1,000 Lbs.	Value \$1,000	1,000 Lbs.	Value \$1,000	1,000 Lbs.	Value \$1,000	1,000 Lbs.	Value \$1,000	1,000 Lbs.	Value \$1,000	1,000 Lbs.	Value \$1,000
Greenland . . . . .	6,659	1,360	8,034	1,622	6,264	1,260	3,841	774	3,853	773	1,203	245
Canada . . . . .	98,681	22,417	75,746	15,374	76,101	15,162	68,461	14,294	55,266	11,313	43,167	8,676
Miquelon . . . . .	641	145	451	95	630	128	420	84	885	177	200	40
Iceland . . . . .	39,268	8,988	31,781	7,011	28,415	5,547	26,714	5,651	17,912	3,925	16,366	3,213
Norway . . . . .	9,203	1,898	17,462	3,578	17,737	3,637	7,807	1,640	3,445	690	12,530	2,505
Denmark . . . . .	4,702	1,007	12,001	2,399	9,253	1,854	8,491	1,700	6,083	1,209	10,171	2,036
United Kingdom . . . . .	-	-	520	101	43	8	-	-	88	19	89	17
Netherlands . . . . .	-	-	-	-	-	-	51	15	-	-	62	16
West Germany . . . . .	2,731	490	4,289	779	3,145	570	1,953	375	1,870	368	1,400	276
Japan . . . . .	2,030	473	155	36	35	6	110	24	14	3	102	15
South Africa Republic . . . . .	2,247	321	2,832	393	1,918	264	760	103	256	38	-	-
Other . . . . .	4	1	-	-	-	-	1	1/	-	-	-	-
Total . . . . .	166,166	37,100	153,271	31,388	143,541	28,436	118,609	24,660	89,672	18,515	85,290	17,039

1/Less than \$1,000.

Source: United States Imports of Merchandise for Consumption, FT-110, Bureau of the Census.

United States market and in 1964 accounted for 59 percent of the total imports of that product. Iceland has been the second important supplier of frozen fish blocks, followed by Norway, Greenland, Iceland, Denmark, and West Germany.



## Virginia

### RESULTS OF RESEARCH DISCUSSED AT NATIONAL SHELLFISH ASSOCIATION MEETING:

The seasonal behavior of MSX in destroying oysters in Virginia was described by the Senior Marine Scientist of the Virginia Institute of Marine Science to the assembled oyster biologists from the entire coastal area of the United States at their annual National Shellfisheries Association meeting in Baltimore, Md., in June 1965.

Along with a thumbnail sketch of periods when mortalities of oysters are most likely to occur, he presented a graph showing the sequence of infections and death rates in disease-free oysters imported from November to June into MSX-infested areas. Some 40 percent of the seed oysters planted in such areas will die before winter and as high as 90 percent will be dead at the end of three years, according to the Institute scientist. He pointed out that on the other hand, if seed oysters are planted in MSX-infested waters after August 1, they become infected but deaths do not occur until the following June. Only short-term storage or holding of oysters is possible in MSX-infested areas.

Institute scientists said that in summer 1964, large numbers of offspring from brood stock which had survived several years in heavily-infested water were successfully raised to seed size--about 2 inches. That seed will be exposed to MSX for several years to eliminate susceptible oysters. The survivors will become parents of the next generation and should exhibit considerable resistance to MSX.

Papers presented by Institute scientists at the meeting included one on two clams found in marine waters, "*Larval Development of Rangia cuneata and Lyonsia hyalina*"; others were "*Salinity Tolerance Limits of Some Species of Pelecypods from Virginia*"; and "*A Program in Virginia for Breeding MSX*

Resistant Oysters by Hatchery and Pond Methods," given at a joint session of oyster biologists and oyster growers. (Virginia Institute of Marine Science, Gloucester Point, June 29, 1965.)

Note: See *Commercial Fisheries Review*, July 1965 p. 43; September 1964 p. 36.



## Wholesale Prices

### EDIBLE FISH AND SHELLFISH, JULY 1965:

Because prices for fresh finfish generally increased from June to July 1965, the wholesale index for edible fishery products (fresh, frozen, and canned) at 109.8 percent of the 1957-59 average rose 0.8 percent. Compared with July 1964, the overall index this July was up 3.0 percent because of higher prices for nearly all items. July 1965 prices were substantially higher than a year earlier for many fresh and frozen fishery products and some canned fish products in short supply.

The subgroup index for drawn, dressed, or whole finfish was up 5.0 percent from June to July because of higher prices for nearly all items. At New York City, wholesale prices were up for western fresh halibut by 14.3 percent as a result of light supplies; western fresh king salmon by 3.6 percent; and Great Lakes round yellow pike by 13.5 percent. At Boston, ex-vessel large haddock prices were up 3.6 percent. But Lake Superior whitefish prices at Chicago were down 4.9 percent. As compared with July 1964, the subgroup index this July was higher by 3.6 percent. Except for salmon, prices were up from a year earlier for all items--25.0 percent for fresh halibut, 3.2 percent for ex-vessel haddock, 22.5 percent for Great Lakes yellow pike, and 11.5 percent for whitefish.

Although July 1965 prices for fresh haddock fillets at Boston were up 12.8 percent from the previous month, they were offset by a price drop (down 3.4 percent) at New York City for South Atlantic fresh shrimp. This brought the fresh processed subgroup index down 0.9 percent. July 1965 prices for shucked standard oysters were unchanged for the 3-month period since May. Compared with July 1964, the subgroup index this July was up 2.9 percent. Prices were higher for all items, but the greatest increase was for haddock fillets (up 16.0 percent).

Wholesale Average Prices and Indexes for Edible Fish and Shellfish, July 1965 with Comparisons								
Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1957-59=100)			
			July 1965	June 1965	July 1965	June 1965	May 1965	July 1964
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned) . . . . .					109.8	108.9	109.2	106.6
Fresh & Frozen Fishery Products: . . . . .					112.8	111.5	112.9	109.3
Drawn, Dressed, or Whole Finfish: . . . . .					119.0	113.3	106.1	114.9
Haddock, lge., offshore, drawn, fresh . . . . .	Boston	lb.	.12	.11	91.4	88.2	74.0	88.6
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.50	.44	147.9	129.4	119.8	118.3
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.90	.87	125.8	121.4	115.3	129.2
Whitefish, L. Superior, drawn, fresh . . . . .	Chicago	lb.	.59	.62	87.3	91.8	86.6	78.3
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.63	.55	102.3	90.1	106.4	83.5
Processed, Fresh (Fish & Shellfish): . . . . .					108.6	109.6	118.9	105.5
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.40	.36	97.2	86.2	80.2	83.8
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.86	.89	100.8	104.3	123.0	98.4
Oysters, shucked, standards . . . . .	Norfolk	gal.	7.13	7.13	120.2	120.2	120.2	118.0
Processed, Frozen (Fish & Shellfish): . . . . .					105.7	106.6	109.4	102.5
Fillets: Flounder, skinless, 1-lb. pkg. . . . .	Boston	lb.	.39	.39	97.6	98.8	98.8	95.0
Haddock, sml., skins on, 1-lb. pkg. . . . .	Boston	lb.	.37	.37	108.5	108.5	109.9	108.5
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.32	.30	112.2	105.2	105.2	108.7
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.88	.89	103.7	105.5	109.7	99.0
Canned Fishery Products: . . . . .					104.9	104.9	103.0	102.2
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. . . . .	Seattle	cs.	22.00	22.00	95.9	95.9	91.5	97.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs. . . . .	Los Angeles	cs.	11.56	11.56	102.6	102.6	102.6	102.1
Mackerel, jack, Calif., No.1 tall (15 oz.), 48 cans/cs. . . . .	Los Angeles	cs.	7.13	7.13	120.9	120.9	120.9	105.9
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs. . . . .	New York	cs.	10.25	10.25	131.5	131.5	131.5	113.0

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

The July 1965 subgroup index for processed frozen fish and shellfish was down 0.8 percent from the previous month. While prices for frozen ocean perch fillets rose 6.7 percent, those for frozen shrimp at Chicago dropped 1.7 percent and for other species of frozen fillets were slightly lower or unchanged from a month earlier. But prices this July were mostly higher than in the same month of 1964, with the subgroup index up 3.1 percent.

July 1965 prices for canned fishery products held at the same level as in the previous month. Market conditions for canned fish

items in the subgroup were better than steady, with some indication of firming because of the light seasonal pack for some products. The new Maine sardine canning season was off to a slow start but improved toward the end of July when the new pack exceeded that for the same period in 1964. (The total 1964 pack was disappointing, however, and much less than in 1963.) The subgroup index this July was up 2.6 percent from the same month a year earlier. Prices were higher for canned Maine sardines (up 16.4 percent) and California jack mackerel (up 14.2 percent). Canned tuna prices were slightly higher than in July 1964 and those for canned salmon slightly lower.







## International

### INTERNATIONAL PACIFIC SALMON FISHERIES COMMISSION

#### FISHING REGULATIONS ADAPTED TO PROTECT EARLY RUNS OF SOCKEYE SALMON TO FRASER RIVER:

As of mid-July 1965, all sockeye salmon runs to the Fraser River were both earlier and lighter than those in the brood year of 1961. Normally, the 1965 Fraser River sockeye runs should be later than those of the preceding cycle.

Early arrival of salmon on spawning grounds has been associated with some pre-spawning mortality. Therefore, when the Horsefly run of sockeye salmon to the Fraser River arrived early, the International North Pacific Salmon Fisheries Commission granted both United States and Canadian fishermen 24 hours of additional fishing for the week commencing July 18, 1965. However, to provide for adequate escapement, the Commission ruled that no fishing in Convention waters would be allowed in the last week of July until a satisfactory number of the Horsefly run has passed above the fishing boundary in the Fraser River.

### GREAT LAKES FISHERY COMMISSION

#### 10TH ANNUAL MEETING:

Lake trout continue to recover in Lake Superior, according to scientists attending the 10th annual meeting of the Great Lakes Fishery Commission, held at Ann Arbor, Mich., June 22-24, 1965. The improvement in recovery is attributed to the 80-percent reduction in sea lamprey populations and the planting of hatchery-reared lake trout to supplement natural spawning in inshore areas.

Canadian and United States scientists carrying out the program reported that all but two of the sea lamprey-producing streams in Lake Superior has been chemically treated

at least once and more than half were treated twice. Although the reduction in sea lampreys was substantial, they were still present in significant numbers in certain isolated areas and possible sources of this continuing infestation were discussed at the meeting. It was agreed that several "problem" streams should be investigated intensively.

Substantial annual plantings of hatchery yearling lake trout are contributing to the fish stocks. An improved natural spawning was noted in the fall of 1964 for the first time since 1959, but it cannot be expected to provide a significant increase in numbers of adult fish for 5 years.

Distinct lake trout populations have been found on isolated offshore grounds which have not been as severely affected by sea lampreys as those near shore. Those grounds are now in a healthy condition and scientists have recommended that they be fished on an experimental basis.

The chemical treatment program which began in Lake Michigan in 1960 has proceeded on schedule and should be completed in June 1966. This past spring, Lake Michigan received its first substantial lake trout planting (1.2 million fish). They were planted in Grand Traverse Bay, off the east shore of Wisconsin's Door Peninsula, along the north shore and in the reef-studded area around Beaver Island.

The Commission's chairman, Donald L. McKernan, Director, U. S. Bureau of Commercial Fisheries, expressed concern at the deterioration of conditions in Lake Erie, once the major commercial producer of fresh-water fish on this continent. In 1955, the Lake Erie catch was 75 million pounds valued at \$9.6 million. In 1964 the catch from that lake was down to only 38.7 million pounds and the value dropped to \$3.6 million. Investigations in Lake Erie have barely been able to follow the changing fish populations and food organ-

### International (Contd.):

isms resulting mainly from pollution. According to the Commission's chairman, the decline in preferred species in Lake Erie is continuing at such a rapid rate that a reappraisal of the situation should be made and a new approach taken in dealing with its problems. (University of Michigan News Service, June 24, 1965.)

Note: See Commercial Fisheries Review, September 1964 p. 52.

### INTERNATIONAL CONVENTION FOR THE NORTHWEST ATLANTIC FISHERIES

#### WEST GERMANY ADHERES TO PROTOCOL CONCERNING HARP AND HOOD SEALS:

On May 26, 1965, the Federal Republic of Germany deposited adherence to a Protocol to the International Convention for the Northwest Atlantic Fisheries of February 8, 1949. The Protocol (done at Washington, July 15, 1963) relates to harp and hood seals and is intended to bring those species within the responsibility of the Northwest Atlantic Fisheries Commission. The Protocol is not yet in force. (Bulletin, U. S. Department of State, June 14, 1965.)

Note: See Commercial Fisheries Review, March 1964 p. 45.

### FOOD AND AGRICULTURE ORGANIZATION

#### PRELIMINARY DRAFT CONVENTION FOR THE CONSERVATION OF ATLANTIC TUNA:

A Working Party of the Food and Agriculture Organization (FAO) agreed July 13, 1965, on a draft international convention for the conservation of Atlantic tuna. The draft will now go before the Conference of FAO which meets in November 1965.

The Working Party has asked the FAO Conference to convene a conference of nations early in 1966 to adopt an Atlantic Tuna Convention. The Government of Brazil has offered to host such a meeting, which might be held in April 1966 at Sao Paulo.

FAO officials point out that there has never been any international action for the protection of Atlantic tuna stocks. Atlantic tuna are fished by many nations and yield an average catch of 300,000 metric tons a year.

The draft convention approved by the FAO Working Party covers the Atlantic Ocean and such adjacent waters as the Caribbean, the Gulf of Mexico, and the Mediterranean. It would set up a new international commission

to deal not only with research but also with recommendations to protect the stocks. It would work in close cooperation with FAO. The commission would be open to all interested member nations of the United Nations and its specialized agencies.

A delegate from Brazil was Chairman of the Working Party Session, July 6-13, 1965. Other delegates attended from France, Japan, Nigeria, Portugal, Senegal, and the United States, together with observers from Cuba, the Federal Republic of Germany, Mexico, and Italy. (Food and Agriculture Organization of the United Nations, Rome, July 13, 1965.)

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#### GLOBAL REGULATION OF WHALING URGED:

Whaling must be regulated at a worldwide level as soon as possible, declared the chief of the Fisheries Biology Branch of the Food and Agriculture Organization (FAO) at the 17th annual meeting of the International Whaling Commission. The most pressing need, according to FAO officials, is the control of whaling from motherships.

In speaking of global whaling regulations, FAO's Fishery Biology chief said, "This is now very urgent in view of the need to establish, without reasonable doubt, the levels of sustainable yield of each species in the seasons 1966/67 and 1967/68, and pave the way for a long-term regime of regulation which will ensure the attainment as soon as possible, by these stocks, of levels at which they can sustain maximum yields."



Fig. 1 - Japanese whaling factoryship in Bering Sea.

Referring to the unanimous decision of the International Whaling Commission to restrict whaling quotas during coming seasons, he continued, "We must remember that the price of unanimity in the agreement... was a concession permitting continued overfishing of the sei and fin whale stocks for a further two seasons. We know that this most unfortunate situation was reached because heavy investments were made in new whaling expeditions notwithstanding the warnings of many scientists over many years that the stocks could not stand such hard exploitation."

At a special conference held in London in May 1965, the Commission recommended a limit of 4,500 blue-whale units for the 1965/66 Antarctic season. In the preceding season (1964/65), the whaling nations took 7,000 units. The Commission recommended that quotas should be further reduced for the 1966/67 and 1967/68 seasons, so that by then the catch would be less than the combined sustainable yield of the stocks of fin and

## International (Contd.):

sei whales. (The whaling industry counts its catch in blue-whale units, one of which equals 2 fin whales or 6 sei whales.) It was pointed out that for years quotas were set far above safe yields, on the grounds that this was economically necessary. Yet most expeditions failed to catch enough whales to justify the high investments.

FAO's Fishery Biology chief said, "Now, the residual stocks will have to bear the brunt of a last-minute attempt to recuperate some of the losses on what turned out to be bad investments. We have to accept this situation and the means now agreed to get out of the dilemma—but we cannot be happy with it. Let us at least learn some lessons from the history of the industry—to develop other fishery industries on the basis of scientific appraisals of the capacity of renewable resources to yield continuously: to take due account, in due time, of the scientific advice."



Fig. 2 — Removing flukes and flensing whale aboard a Japanese factoryship in Bering Sea.

The FAO spokesman said his organization urged taking advantage of the next two years to make a full appraisal of all available whale stocks, especially of the remaining sperm and blue whales. He pledged FAO's full cooperation in resolving all outstanding questions related to world whaling. If whaling was to survive as a major industry, he said, FAO believes that one immediate action is the establishment of an international observer system to check on observance of the new whaling quotas. (Food and Agriculture Organization, Rome, June 29, 1965.)

## INTERNATIONAL WHALING COMMISSION

## 17th ANNUAL MEETING HELD:

The opening session of the 17th annual meeting of the International Whaling Commission, held in London June 28–July 2, 1965, was addressed by the Minister of State for Scotland. He said that at the present time the Antarctic whaling industry was confronted by great difficulties because conservation schemes have not yet been sufficient to maintain the whale stocks at a satisfactory level. Conservation demands immediate sacrifices if whaling is to survive and give an economic return. The agreement at the Commission's Special Meeting in May 1965 that the Antarctic catch limit should be reduced to 4,500 blue-whale units for the next season (1965/66) and that reductions should be made in the following two years to a level which will allow the stocks to recover is a very gratifying one. He concluded by saying that he hoped all concerned would accept the full

implications of the situation and support the further reductions necessary if the stocks are to be rebuilt from their present depleted conditions and that the foundations of a prosperous future might be laid.

A total of 15 expeditions (7 Japanese, 4 Soviet, and 4 Norwegian) operated in the Antarctic in the 1964/65 season and caught a total of 20 blue whales, 7,308 fin whales, and 19,874 sei whales for a total of 6,986 blue-whale units (1 blue-whale equals 2 fin or 6 sei whales). In addition, those expeditions caught 4,211 sperm whales in the Antarctic. In the previous season there were 16 expeditions (7 Japanese, 4 Norwegian, 4 Soviet, and 1 Dutch) which caught a total of 112 blue whales, 13,870 fin whales, 2 humpback whales, 8,286 sei whales amounting to 8,429 blue-whale units in all, and also 6,651 sperm whales. The total production of baleen and sperm oil from the 1964/65 Antarctic pelagic season amounted to 1,158,841 barrels (1 barrel equals about  $\frac{1}{2}$  metric ton); this compared with a production of 1,299,476 barrels from the 1963/64 catch.

Two Antarctic land stations at South Georgia were operated by Japanese whaling companies in 1964/65, catching a total of 1,150 whales (503 fin, 506 sei and 141 sperm) yielding 45,806 barrels of oil. That compares with a total of 1,021 whales taken from those two land stations in 1963/64 from which 41,282 barrels of oil were produced. Outside the Antarctic, 36 land stations and 7 factoryships operated in 1964, and a total of 28,527 whales were taken (256 blue, 4,731 fin, 316 humpback, 4,986 sei, 18,054 sperm, and 184 other species). In addition, the Antarctic pelagic expeditions caught 4,316 sperm whales on their way to the Antarctic bringing the total catch outside Antarctic waters to 32,843 whales. Total oil production amounted to 882,159 barrels. Comparable figures for 1963 were 33,433 whales (including 3,659 sperm whales taken by Antarctic pelagic expeditions north of 40° South latitude) and 925,045 barrels of oil.

The regulations of the International Convention for the Regulation of Whaling are contained in a document called the Schedule which is amended from time to time by the Commission. The amendments come into force after 90 days from the date of their notification to the Contracting Governments. If an objection is received within that period, the amendment does not become effective for another 90 days. Any other Contracting Government may object during that time, or before the expiration of 30 days from the date of receipt of the last objection received during the additional 90-day period, whichever date shall be the later. Thereafter the regulation becomes effective for all Contracting Governments who have not objected.

At the 17th Annual Meeting the Commission agreed on several amendments of the Schedule. No quota of blue-whale units for the 1964/65 season in the Antarctic had been agreed upon at the 16th Meeting, but at the Special Meeting in May 1965, Commissioners had agreed to recommend to their Governments that the quota for the 1965/66 Antarctic season should be 4,500 blue-whale units and that further reduction should be made in the 1966/67 and 1967/68 seasons so that the quota for the 1967/68 season would be less than the combined sustainable yields of the fin and sei whale stocks as determined on the basis of more scientific evidence. At the 17th meeting this recommendation of the Special Meeting was implemented by an amendment of the Schedule which was proposed by the Commissioner for the United Kingdom and seconded by the Commissioner for Canada. The amendment was to delete in Paragraph 8 (a) the

## International (Contd.):

words "10,000 blue-whale units in 1963/64" and add "4,500 blue-whale units in 1965/66. There shall be further reductions for the years 1966/67 and 1967/68 that will assure that the total catch for 1967/68 will be less than the combined sustainable yields of the fin and sei stocks as determined on the basis of more precise scientific evidence." On being put to the vote, all 12 Commissioners present at the meeting were in favor of the amendment.

The Commission agreed without dissent that in Paragraph 4 of the Schedule it would be forbidden to kill blue whales in the Pacific ocean and its dependent waters north of the equator for 5 years beginning with the 1966 season. The proposal was made by the Commissioner for Canada and seconded by the Commissioner for the United States. Also in the Pacific, it was proposed by the Commissioner for Japan and seconded by the Commissioner for Australia that it would be forbidden to kill humpback whales for the 1966 season in the North Pacific ocean and its dependent waters north of the equator. This amendment of Paragraph 4 of the Schedule was carried without dissent.

Concern was expressed about the increased taxation of the stocks of sperm whales. There had been much larger catches in the last year and it was feared that decreased whaling in the Antarctic might divert more factoryships to hunt that species in the area outside the Antarctic where the females and breeding stocks are found. Furthermore, while the minimum size limits of a 38-foot length should be enough to save the great majority of females, massive evidence was available to the Commission to show that this regulation was being broken on a large scale. Although much more information is needed on the state of the stocks of that species, it was pointed out that delaying conservation action until better evidence on depletion is obtained has already shown us examples of having waited until the sustainable yield is no longer economic.

With these arguments before it the Commission therefore considered a Schedule amendment moved by the Commissioner for Australia and seconded by the Commissioner for New Zealand which stated "It is forbidden to use a whale catcher attached to a factoryship for the purpose of killing or attempting to kill sperm whales in the waters between 40° South latitude and 40° North latitude." The amendment was carried by 7 votes to 2 but there were 4 abstentions.

One paragraph in the Schedule to the Convention gives the number of blue-whale units caught in the Antarctic after which daily records of catches must be sent to the Bureau of International Whaling Statistics at Sandefjord, Norway, so that the latter can indicate to the factoryships the day when the total quota will have been reached and they must cease operations. At present the number refers to the quota for 1963/64 and stands at 9,000. For the future, however, it was proposed by the Commissioner for Australia and seconded by the Commissioner for Japan that Paragraph 8(c) of the Schedule should be changed to delete the "9,000" in the third from last line and replace it by the words "85% of whatever total catch limit was imposed by the Commission." The proposal was accepted by all Commissioners present.

In connection with other provisions of the Schedule which were on the Commission's agenda, no action was

taken. This means that for the next Antarctic season the Sanctuary area will remain open and the dates for starting and ending the baleen whale seasons remain the same.

The International Observer Scheme was the subject of a proposal by the Norwegian delegation amended by the Japanese delegation and adopted by the Commission. This drew attention to the agreement made in 1963, its nonimplementation, and the fact that it expires after the 1965/1966 season. It strongly requested the countries concerned to operate it in the forthcoming season and invited each of the active pelagic whaling nations to give a firm assurance at the 17th Meeting to the effect that they would put the scheme into operation in the 1965/66 season in accordance with the rules for the implementation of the International Observer Scheme agreed upon among the 5 countries concerned in Sandefjord on June 26, 1964. Two of the active pelagic whaling nations were able to give this assurance but the Soviet delegation stated that while they were in favor of implementation of the Scheme in the coming season their assurance must be qualified by the reserve that both the quota of the whale catch and the International Observer Scheme should be extended both to factoryships and to all land stations catching Antarctic whales and that to implement the International Observer Scheme it is necessary to solve on a just basis the problem of reallocation of national quotas between the countries concerned. It appears that talks on these matters will be continued but no solution of these problems had been worked out by the end of the Commission's Meeting.

The Commission noted that the catching of Antarctic whales from land stations south of 40° South latitude as well as in other areas of the Southern Hemisphere has increased its importance in the light of the recent situation of whale stocks in the Antarctic. They thought it desirable to set up a special group representing member countries concerned with those land stations to bring into order the catching of whales in those places and to study the setting up of an observer scheme applicable to them. The group should make appropriate suggestions and recommendations for discussion at the 18th Meeting of the Commission.

It was agreed that the Commission shall determine the total catch limit of Antarctic pelagic whaling for the 1966/67 season after taking into consideration the catch of Antarctic whales from the land stations mentioned in the previous paragraph. The Commission also invited the Governments concerned with land stations to take domestic measures on a voluntary basis so that the level of catch for the forthcoming season does not exceed that in the 1964/65 Antarctic season or the average (calculated in blue-whale units) of the catches over the last three seasons, 1963, 1964, and 1965 outside the Antarctic as the case may be.

To countries at present discussing the problems of national quotas, the Commission recommended that for the 1966/67 and 1967/68 seasons they take into consideration the catches of Antarctic whales from land stations situated south of 40° South latitude as well as in other areas of the Southern Hemisphere.

Although the taking of blue whales in the area south of 40° South latitude is forbidden, this provision in the Schedule was objected to after the 16th Meeting by all the Antarctic pelagic whaling countries. The result is that the blue whales are still not protected in Antarctic waters north of 55° South latitude from 0° eastward to 80° East longitude. The Commission therefore agreed

## International (Contd.):

at this meeting to an appeal being sent to the the Antarctic pelagic countries to withdraw their objection to the change in the Schedule 6(3) brought about by the deletion of the words "except in the waters north of 55° South latitude from 0° eastwards to 80° East longitude."

In view of the Scientific Committee's views on the threat to the whale stocks in the North Pacific area where, for instance, against a catch of 3,991 fin whales in 1964 there was an estimated sustainable yield of 1,600, the Commission considered that the 4 North Pacific countries should meet immediately after the meeting to discuss conservation measures to be taken. It was also agreed that a Sperm Whale Sub-Committee should meet either just before or just after the North Pacific Working Group which should assemble as soon as possible after the 1965 season.

The Commission considered that, in view of the offer of the Director-General of the Food and Agriculture Organization (FAO) to help in a cooperative program of stock assessment in connection with Antarctic and other whales, provided adequate conservation plans were in train, the Secretary should be asked to resume arrangements similar to those intended at the time of the last meeting.

The countries party to the Arrangements for the Regulation of Antarctic Pelagic Whaling of 1962, represented by their Commissioners, met together before and during the 17th Meeting to discuss proposals for the allocation of national quotas but had not been able to conclude these discussions by the end of the meeting.

On the proposal of the Commissioner for Australia, seconded by the Commissioner for the United States and with the approval of the Commissioners present, it was agreed that the Commission should appeal to Chile and Peru to adhere to the 1946 Convention for the Regulation of Whaling. In the meantime they should be asked to observe the minimum lengths applying to sperm whales and continue to supply completed statistical data to the Bureau of International Whaling Statistics.

Present at the 17th annual meeting were Commissioners and delegates of Contracting Governments from Argentina, Australia, Canada, Denmark, France, Iceland, Japan, Mexico, the Netherlands, New Zealand, Norway, South Africa, United Kingdom, United States, and the Soviet Union. Observers also attended from Chile, Italy, Portugal, Peru, the Food and Agriculture Organization of the United Nations, the International Council for the Exploration of the Sea, and others. (Press release of International Whaling Commission, London, July 7, 1965.)

Note: See *Commercial Fisheries Review*, July 1965 p. 59; September 1964 p. 54.

## FISH MEAL

# **PRODUCTION AND EXPORTS FOR SELECTED COUNTRIES, JANUARY-APRIL 1965:**

Member countries of the Fish Meal Exporters' Organization (FEO) account for about 90 percent of world exports of fish meal. The FEO countries are Chile, Angola, Iceland,

Country	April		Jan.-Apr.	
	1965	1964	1965	1964
	. . . . (1,000 Metric Tons). . . .			
Chile . . . . .	9.5	10.1	40.7	53.0
Angola . . . . .	3.5	2.6	19.7	15.9
Iceland . . . . .	4.8	8.7	32.1	40.5
Norway . . . . .	17.5	24.1	60.0	77.8
Peru . . . . .	163.1	142.4	627.9	532.1
So. Africa (including S.-W. Africa) . . .	24.0	18.1	66.4	62.7
Total . . . . .	222.4	206.0	846.8	782.0

Country	April		Jan.-Apr.	
	1965	1964	1965	1964
	. . . . (1,000 Metric Tons). . . .			
Chile . . . . .	3.7	13.3	37.5	60.8
Angola . . . . .	2.3	2.7	15.6	17.6
Iceland . . . . .	4.4	10.1	27.2	31.1
Norway . . . . .	23.2	31.5	79.2	74.8
Peru . . . . .	149.9	158.8	658.2	654.4
So. Africa (including S.-W. Africa) . . .	37.6	32.8	111.9	96.6
Total . . . . .	221.1	249.2	929.6	935.3

Norway, Peru, and South Africa/South-West Africa.

Peru accounted for about 74 percent of the 846,800 metric tons of fish meal exported by FEO countries in January-April 1965.

## CODEX ALIMENTARIUS COMMISSION

## **COMMITTEE ON FOOD HYGIENE HOLDS SECOND MEETING:**

In connection with work to develop international food standards, the Expert Committee on Food Hygiene held its second meeting, June 14-16, 1965, in Rome, Italy. The Committee, which is under the chairmanship of the United States, is one of the working groups of the FAO/WHO Codex Alimentarius (Food Standards) Commission. Food hygiene is included in the program because that element is essential to insure a food standard that is both effective and acceptable.

The Rome meeting of the Food Hygiene Committee was attended by delegates from Australia, Canada, Cuba, Denmark, France, Israel, the Netherlands, New Zealand, Poland, Sweden, Switzerland, the United Kingdom, and the United States.

The purpose of the meeting was to discuss: (1) the terms of reference of the Committee,

### International (Contd.):

(2) reports of subcommittees appointed at the first meeting of the Committee (held May 27-28, 1964, in Washington, D. C.), and (3) new work assignments.

The extent of the Hygiene Committee's authority was a major point of discussion during its first meeting. At issue was the relation of the Hygiene Committee to the various Codex Committees on standards for individual commodities. Clarifying directives of the parent Codex Commission were reported at the opening of the second meeting of the Hygiene Committee. Under those directives, the Hygiene Committee may consider specific hygiene requirements when requested by a Commodity Committee, or on its own initiative where no Commodity Committee has been established. The Hygiene Committee may also consider hygiene matters if, in its expert opinion, such matters have not been adequately covered by a Commodity Committee. Although a Commodity Committee is not required to refer hygiene matters to the Hygiene Committee, the former must inform the latter when hygiene matters are being considered.

During the discussion on jurisdiction, the Hygiene Committee decided to request a widening of its authority so that it might examine all hygiene aspects of a commodity as far back as initial production if relevant to standards for the final product.

After considerable discussion, the Hygiene Committee approved a revised draft of General Principles and Guidelines for Food Hygiene Standards. It will be submitted to member Governments for comments, before being prepared in final form at the next meeting of the Committee.

A draft of hygiene standards for fish and fish products was not presented at the meeting. The United Kingdom, which had been assigned that task, reported that the draft standards would be ready for submission at the next meeting. During the discussion, a question arose as to the definition of fish products. An FAO representative said the term as it related to the work of the Hygiene Committee covered fish and crustacea, but not molluscs. To fill the gap, the United Kingdom, with the United States and Canada as collaborators, was assigned the responsibility of preparing draft hygiene standards covering all aspects of the production and processing of molluscs.

Reports by the Netherlands on salmonella and aflatoxin were reviewed briefly. The Committee decided that salmonella should be separately considered as it related to the development of hygiene standards for specific commodities. The Committee postponed a consideration of the aflatoxin problem until the results of additional research are available.

The only specific new work proposal for the coming year involving fish was the assignment for the drafting of standards for molluscs. Fish may be indirectly involved in the preparation of a report on special standards for developing countries. In addition, a report on standards for fish processing plants will be revised during the year.

The third annual meeting of the Hygiene Committee will probably be held in May or June 1966. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, July 7, 1965.)

Note: See Commercial Fisheries Review, Dec. 1964 p. 76, and Sept. 1964 p. 1.



## Australia

### DEVELOPMENT OF COMMERCIAL SHRIMP FISHERY PROMISING:

Hopes for the establishment of a commercial shrimp fishing industry in the Gulf of Carpentaria have been strengthened by continued good shrimp catches by the Australian Government's chartered survey vessel Rama, and three other trawlers working in that area. The survey is being supervised by a committee made up of representatives of the Commonwealth Department of Primary Industry, the Commonwealth Scientific and Industrial Research Organization, and the Queensland Department of Harbours and Marine.

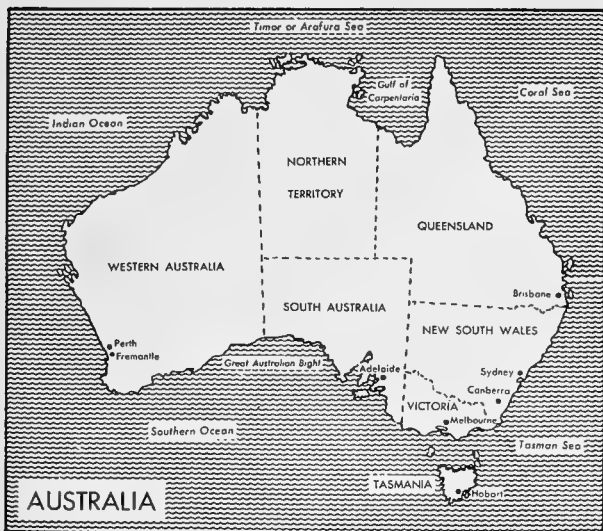
Encouraged by promising catches in April and early June 1965, the Commonwealth and Queensland Governments have decided to extend the survey until August.

On April 14, the Rama and another vessel each caught nearly 3,000 pounds of banana shrimp (Penaeus merguensis) in single drags but lost most of them through gear breakage. On May 31, the same two vessels landed 5,000 pounds of shrimp. This was followed early in June by 4 vessels taking between them 10,000



## Australia (Contd.):

pounds of banana shrimp in a morning. Two of the vessels had arrived in the Gulf a few days previously and were unfamiliar with local conditions. Individual drags varied from 200 to 2,000 pounds of banana shrimp.



The catches were made in the southeastern section of the Gulf, about 30 miles from Karamba, at the mouth of the Norman River where a shrimp-processing plant has been established by a Sydney food exporting firm.

Bad weather prevented fishing for a while but one of the smaller vessels managed to get out for a brief period and caught so many banana shrimp in a small net on its second trial haul that the gear broke and all but 100 pounds of shrimp were lost.

Close cooperation of the fishing industry and government has been a feature of the survey and the explorations have been narrowed down to a point where the survey team can indicate with some confidence areas of greatest probability. (Australian Fisheries Newsletter, July 1965.)

Note: See Commercial Fisheries Review, August 1965 p. 67, and April 1965 p. 57.

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### CONTRIBUTES FUNDS TO START FISH FARMING IN PHILIPPINES:

The Australia Freedom From Hunger Campaign organization will contribute £65,945 (US\$147,717) over a three-year period for a project designed to set up fresh-water fish

nurseries in the Philippines so as to provide the population with a source of protein food. A five-year plan has been drawn up to establish 10 fresh-water nurseries, 20 brackish-water nurseries, and 16 oyster farms. Experts will be trained to give demonstrations which will show Philippine farmers the possibilities of starting fish culture on farms.

The Australian Freedom from Hunger Campaign Committee will also support a Catholic Overseas Relief project, estimated to cost £16,337 (\$36,600), which will provide needy fishermen with seaworthy fishing craft and make possible the setting up of new fishing cooperatives in the Philippines. (Australian Fisheries Newsletter, July 1965.)

\* \* \* \* \*

### FOREIGN TRADE IN MARINE OILS, FISCAL YEARS 1962/63 AND 1963/64:

Since the closure of humpback whaling after the 1963 season, Australia has been primarily an importer rather than an exporter of marine oil. In fiscal year 1963/64 (July 1963-June 1964), Australian imports of whale oil showed a gain of 59 percent over the previous year. Imports of other marine oils, with the exception of cod-liver oil, were also up substantially.

Australian Imports of Marine Oil, Fiscal Years 1962/63 and 1963/64		
Commodity	1963/64	1962/63
	. (Imperial Gallons) .	
Whale oil . . . . .	653,494	410,404
Cod-liver oil (including refined). . .	86,201	95,396
Other marine oils . . . . .	164,399	135,445

Australian exports of marine oil are limited and consist largely of small shipments to Pacific Island destinations. (Agricultural Attache, United States Embassy, Canberra, June 15, 1965.)

Note: See Commercial Fisheries Review, May 1965 p. 58.



## Canada

### FEDERAL-PROVINCIAL PRAIRIE FISHERIES COMMITTEE MEETING:

A further step toward the establishment of a regional export-sales organization for Canadian fresh-water fish products was taken in April 1965 at a meeting in Ottawa of the Federal-Provincial Prairie Fisheries Com-

## Canada (Contd.):

mittee. Officials of the Federal Departments of Fisheries, Trade and Commerce, and others concerned will establish a technical group to study the feasibility of such an organization from all points of view and effect a design for consideration by both Federal and provincial governments.

The Committee also considered proposals made by subcommittees on suggested designations of grades of fish and standards of quality for the fishery products of the Prairie Provinces, the Northwest Territories, and north-western Ontario. A report on the concept of provincial loan boards and its possible application to the Prairie Provinces was also considered. At the meeting the Committee also was given an outline of the Federal Government's Fishing Vessel Assistance Plan and the problems associated with its possible extension to the Prairie Provinces.

Another report heard by the committee was on the Federal Government's Fisheries Indemnity Plan for vessels and equipment, and it was agreed that the inland provinces should advise the Federal Government regarding their interest in extension of the plan to their fisheries.

Other matters considered at the meeting were plans for economic research in the fresh-water fisheries of Canada and development of an improved statistical system for those fisheries. Federal-provincial programs in Newfoundland were described for the benefit of the Prairie members of the Committee, and other matters discussed were information, education, and extension services.

The Committee is made up of Deputy Ministers of Federal and provincial departments concerned with fisheries. (*Trade News*, April 1965.)

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#### NEW COMMISSION TO STUDY EXPORT MARKETING PROBLEMS OF FRESH-WATER FISHERIES:

On July 9, 1965, the Canadian Prime Minister announced the establishment of a 1-man Commission to consider and report on the export marketing problems of the fresh-water fishing industry in the Provinces of Manitoba, Saskatchewan, Alberta, and Ontario, and the Northwest Territories.

The inquiry arises out of recommendations made by the Federal-Provincial Prairie Fisheries Committee. That Committee has been studying the problems of instability of prices and demand in export trade in fresh-water fishery products, as well as means for improving returns to primary producers by more efficient marketing.

The new Commission will study the nature of factors affecting prices for fresh-water fish, particularly in the export market, and the possibility of better coordination of production and supply in relation to demand, in order to achieve more orderly marketing. It will also study the possibility and desirability of establishing an export marketing board.

The Canadian Department of Trade and Commerce and the Department of Fisheries will assist in the inquiry, which is expected to last about 6 months. (United States Embassy, Ottawa, July 13, 1965.)

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#### LAMPREY CONTROL EXPERIMENT GROUP HEADQUARTERS RELOCATES:

The Lamprey Control Experiment Group of the Fisheries Research Board of Canada is being consolidated in larger quarters at Sault Ste. Marie, Ont., in order to increase the efficiency of its operations, Canada's Fisheries Minister announced July 8, 1965. It will involve the transfer of part of the group's staff from the board's biological station at London, Ont., to Sault Ste. Marie, a more advantageous point from which to direct the lamprey control experiment in the Great Lakes. A new building there was to be completed and the entire staff installed by the beginning of September 1965.

The Fisheries Research Board carries out Canada's share of the lamprey control work of the Great Lakes Fishery Commission, a Canadian-United States body which is attempting to control the predatory sea lamprey in the Great Lakes, where it has had serious effects on commercially valuable stocks of lake trout and whitefish. (Canadian Department of Fisheries, Ottawa, July 8, 1965.)



Ceylon

UNITED STATES EXPERTS SOUGHT TO TRAIN CEYLONESE FISHERMEN:

The Government of Ceylon is establishing a Fisheries Training Institute to help develop its fisheries. Ceylon is seeking qualified personnel from the United States and other countries to staff the Institute and teach marine engineering; electrical, mechanical, and refrigeration engineering; and fishing techniques. Ceylon is particularly interested in recruiting experienced personnel to teach modern fishing methods. Hiring foreign experts on a contract basis has been suggested by Ceylon.

To supply protein to its people and relieve its dependence on imports, Ceylon is striving for a 5-fold increase in its annual fisheries catch of about 100,000 metric tons. That will be a major task. Ceylon has 75,000 fishermen operating a fishing fleet of about 20,000 vessels. But only 2,300 of those vessels are motorized. The proposed Fisheries Training Institute can play a vital role in Ceylon's move to advance from ancient to modern fishing methods.

Note: Interested persons, firms, or institutions in the United States can obtain additional information about the Institute by writing to the Ceylon Fisheries Corporation, P. O. Box 258, Colombo, Ceylon. Information may also be obtained from the American Embassy, Colombo, Ceylon.



Chile

FISH MEAL PRODUCTION CONTINUED AT LOW LEVEL IN MAY 1965:

With the anchoveta shortage continuing, Chilean fish meal production in May 1965 totaled only 4,152 metric tons--a drop of 71 percent from the 14,501 tons produced in the same month of the previous year. Chilean fish meal production in January-May 1965 amounted to 42,119 tons, as compared with 75,253 tons in the first 5 months of 1964.

The Chilean anchoveta catch in May 1965 totaled 22,347 tons and in January-May 1965 amounted to only 252,789 tons. The Chilean fish meal industry has had only a few months of good fishing during the last 2 years, and there has been a continuous shortage of anchoveta since mid-1964. The dependence of the industry on an inshore fishery has turned out to be a serious problem. (The Continental Shelf is narrow off northern Chile, so Chilean

purse seiners work close to shore. Also, since the vessels have a limited range and do not usually carry ice, they must deliver anchoveta shortly after they are caught.)

At its height, the Chilean fish meal industry employed more than 5,000 people. Unemployment in the industry is now at least 50 percent, according to conservative estimates. (United States Embassy, Santiago, July 14, 1965, and other sources.)



Denmark

POND TROUT SURPLUS LEADS PRODUCERS TO SEEK MINIMUM EXPORT PRICES:

Danish trout producers and exporters are concerned over a surplus production of trout, possibly amounting to 1,000 metric tons, despite increased exports during the first 6 months of 1965. Production has increased more rapidly than exports because the adoption of dry feeds in pellet form as a trout food has reduced mortality during the growing period from 50 percent to about 20 percent. About 700 Danish trout farms, mostly in Jutland, find the dry feeds much more uniform in quality than the raw fish used as feed in the past.

Danish Pond Trout Supply Situation, January-June 1965 with Comparisons						
Trout	Exports				Production	
	Jan. -June		Year		Year	
	1965	1964	1965	1964	1965	1964
	(Metric Tons)					
Live . . . .	1,024	934	1,771	1,344	1/	1/
Fresh . . . .	2,269	1,961	3,896	3,908	1/	1/
Frozen . . .	1,735	1,154	2,527	2,532	1/	1/
Total .	5,028	4,049	8,194	7,784	8,400	8,000
1/Breakdown not available.						

Market demand for Danish trout was less than the available supplies during the first half of 1965. The surplus trout were kept alive in the ponds, and frozen stocks were not much larger than normal. Although exports increased 24 percent during the first 6 months of 1965 as compared with the same period in 1964, wholesale prices for trout dropped at least 1 krone per kilo (6.6 U. S. cents per pound). Some reports indicated that the price paid trout farmers for 6- to 8-ounce round trout had dropped to as low as 24-26 cents per pound from earlier levels of 40 cents a pound.

## Denmark (Contd.):



Fig. 1 - A pond trout enterprise in Denmark.

The Danish producers and exporters are seeking a solution to their surplus problem through use of a new Danish fisheries export law which became effective July 1, 1965. It permits the Danish Fisheries Minister to establish minimum prices for exports of fish and fishery products upon the request of the appropriate industry branch association and after discussion with an export committee made up of representatives of the major Danish fisheries associations. The trout producers have not had a representative association since 1961 when marketing problems disrupted the association then in existence. But they are forming a new association to be known as the Trout Producers Association of 1965 (Ørredproducentforeningen af 1965). Although the name of the new trout association mentions only "producers," it will also include exporters because practically all of them also are producers. One cooperative owned by several hundred trout farmers produces and markets about 45 percent of the Danish trout production.

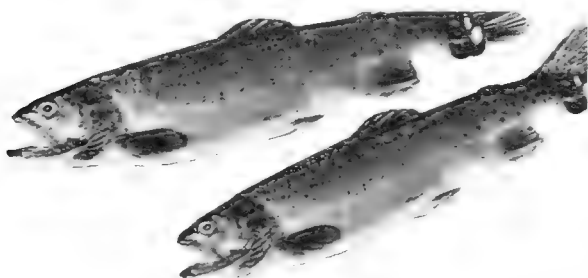


Fig. 2 - Danish pond rainbow trout.

The new trout association is expected to request that minimum prices be established for pond trout exports and that a tax on those exports be collected. The funds collected would be pooled and used to: (1) promote

sales, (2) equalize prices on foreign markets, and (3) control production. Minimum export prices would be requested for all types of pond trout exports and for each market. Therefore, prices may differ for different countries. It is expected that the disparity in prices would be adjusted for producers out of the fund developed by the tax on exports. Those selling to certain markets for lower prices would be subsidized from the higher prices paid in other markets. About 80 percent of the Danish trout producers are reported to have agreed to seek minimum export prices. A meeting with the Fisheries Minister was scheduled for the week of July 19, 1965.

Exports of Danish frozen pond trout to the United States during the first 6 months of 1965 totaled 358.8 metric tons as compared with 226.1 tons during the same period in 1964. (United States Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, July 16, 1965.)



## German Federal Republic

## INCREASED SUBSIDIES FOR FISHING INDUSTRY ASKED BY COASTAL STATES:

**Summary:** In a memorandum submitted June 9, 1965, to the Federal Government, the four German coastal States (Bremen, Hamburg, Lower Saxony, and Schleswig-Holstein) said that the Government support program for the fishing industry in 1961-1964 was inadequate, and that long-term Government aid to the fishing industry is needed. Following the submission of the memorandum, the German Bundesrat (upper legislative house) approved a motion presented by a deputy from Bremen requesting increased Federal support for the German fishing industry.

The States asked the Federal Government to provide (1) DM15 million (US\$3.75 million) in fiscal year 1966 to continue ex-vessel price supports in the form of "quality premiums"; (2) DM1 million (\$250,000) during the next 2 years to continue scrapping premiums for obsolete vessels; (3) DM 5 million (\$1,250,000) a year to support export subsidies designed to remove surplus fish and stabilize domestic market conditions; (4) DM 2.5 to 3.5 million (\$625,000 to \$875,000) to aid in the construction of 8 new cutters; and (5) greater subsidization of interest rates on commercial fishery loans.

### German Federal Republic (Contd.):

The four coastal States asserted that the unfavorable position of the German fishing industry is in large measure due to the expansion of fishery imports that followed tariff liberalization. The States claim that even the extensive Government support requested would afford only partial relief; a basic change in the situation cannot be achieved on a national level. Therefore, special emphasis is placed by the memorandum upon the early development of a fish-marketing order by the European Common Market (EEC).



Fig. 1 - One of the older trawlers in the German fishing fleet.

**Review of Previous Federal and State Support for Fisheries:** Summarizing the 3-year support program of the German Federal Government carried out during 1961-1964, the memorandum of the coastal states noted that the program provided scrapping premiums for obsolete vessels and subsidies ("quality premiums") for fish landings. In particular, the objectives of the Federal program were:

(1) **TRAWLER FISHERY:** To promote an increase in factory-trawlers and freezing fish at sea, as well as the modernization of smaller trawlers which land fresh fish.

(2) **LUGGER FISHERY:** To develop new types of luggers capable of fishing year round, and to improve the marketability of salted herring by preprocessing.

(3) **CUTTER FISHERY:** To develop new types of cutters, and to improve marketing through cooperatives and similar organizations.

The funds made available by the Federal Government for those purposes have been supplemented to a significant degree by the coastal States.

Considerable investments in cold-storage facilities were also made by the fishery ports.



Fig. 2 - German herring lugger behind oil supply boat in foreground in Hamburg-Altona fish harbor.

Furthermore, the coastal States contributed funds to investments necessary to carry out the Federal program.

**Continuation of Federal Program:** The memorandum asserted that during the initial 3-year period of the Federal program it was possible to complete successfully only certain individual measures, such as the scrapping of obsolete vessels. The memorandum stated that even though some productivity gains were made in domestic fisheries, increased imports made it difficult to create a marketing situation favorable to the fishing industry.

The German trawler fishery is said to have incurred losses amounting to DM 24.5 million (\$6,125,000) in 1963, and losses in 1964 are estimated at about the same amount. Losses incurred by the lugger fishery reportedly amounted to DM 5.6 million (\$1.4 million) and DM 5.1 million (\$1,275,000) in 1963 and 1964, respectively. The situation in the cutter fishery is also believed to have deteriorated in recent years.

The memorandum expressed hope that the adoption of a European Common Market (EEC) fishery policy would permit an improvement in the status of the domestic fisheries. Until that time, however, the German fishing industry will seek Federal support. In order to cover at least part of the losses incurred by the various sectors of the fishing industry, a minimum of DM 15 million (\$3,750,000) in Federal funds in fiscal 1966 is being requested to provide ex-vessel price supports in the form of quality premiums. The memorandum claimed that, in addition, it will be necessary to continue to subsidize the scrapping of obsolete vessels, particularly cutters, at the rate of DM 500,000 (\$125,000) during each of the next 2 fiscal years. It was suggested that the Federal Government not only continue its periodic investigations into

### German Federal Republic (Contd.):

the financial status of the trawler trade but also extend them to include the lugger fishery.

Stabilization of Marketing Conditions: The memorandum noted that after the Fish Law of 1955 failed to create a marketing situation favorable to the fishing industry, the trawler and lugger fisheries endeavored to stabilize marketing conditions through the institution of cooperative sales organizations. At first those organizations contributed significantly to a stronger market position. However, the liberalization of fishery imports forced those organizations continuously to take special measures in the interest of market stabilization. Such measures not only included controls on domestic landings, but also the granting of export subsidy payments by the trawler cooperative sales organization totaling DM 7.6 million (\$1.9 million) in 1962, DM 9.8 million (\$2,450,000) in 1963, and DM 7.4 million (\$1,850,000) in 1964.

In order to remove surplus herring supplies from the West German market, the central sales organization of the German lugger fisheries sold salted herring at reduced prices to foreign countries and to East Germany. The "export subsidies" thus granted by the lugger fishery amounted to DM 0.7 million (\$175,000) in 1963 and DM 1.3 million (\$325,000) in 1964.

The memorandum asserted that in spite of the wide range of self-help measures, the fishing industry has not succeeded in stabilizing the market to the necessary degree, and it therefore suggested that the Federal Government appropriate at least DM 5 million (\$1,250,000) a year for that purpose.

Subsidization of Interest Rates on Commercial Loans: The memorandum noted that, as the result of structural changes which have been taking place in the German trawler fleet, investment in new vessels has increased significantly. The construction costs of a modern factory-trawler have increased to DM 8-9 million (\$2.0-2.25 million); those of a fresh-fish trawler or a stern lugger have risen to DM 3.5-5 million (\$0.9-1.2 million). In view of attractive investment opportunities in other sectors of the economy and the comparatively low returns on investments in the fishing industry, it would be possible to attract the capital required by the fishing industry only if

interest rates on commercial fishery loans are subsidized in all cases, rather than having such support subject to individual needs. So far, interest subsidization has been restricted to the construction of new factory-trawlers, luggers, and cutters.

Special Measures for the Cutter Fishery: With regard to the cutter fishery, Government support has merely permitted cutter operators to cover necessary maintenance and repair costs. However, such aid has not prevented the aging of the cutter fleet. On the other hand, cutters may be able to fill the gap in fresh fish production created by the trawler fleet's growing concentration on producing frozen fish. In order to take advantage of that market potential, new and modern cutters are needed. However, the cost of such cutters (patterned upon Danish or Swedish design) far exceeds the financial resources of individual cutter operators even if low-interest loans are granted by the Government. The memorandum therefore suggested that the Federal Government and the coastal States support the foundation of new corporations for the purpose of building new cutters and then chartering them to young and enterprising operators. The cost of such cutters would amount to DM 600,000 to DM 900,000 (\$150,000 to \$225,000) each. The Federal Government would be asked to contribute half of the cost of building eight such cutters.

European Common Market Fisheries Policy: Finally, the memorandum concluded that the unfavorable situation in the German fishing industry is caused by prevailing market conditions. Government aid can afford only partial relief, without effecting a basic change. In view of progressive economic integration within the European Common Market (EEC) and commitments under the German foreign trade policy, such a change can no longer be achieved by legislative measures on a national level. It should rather be an objective of an EEC-wide fish marketing order. (United States Consul, Bremen, July 9, 1965.)

Note: See Commercial Fisheries Review, March 1962 p. 39.



### Ghana

#### RECEIVES FOUR MORE NORWEGIAN-BUILT STERN TRAWLERS:

Four new stern trawlers built for Ghana by a Norwegian shipyard combine were turned



## Ghana (Contd.):

over to a Ghanaian delegation in Norway during early summer 1965. Two other Norwegian-built trawlers of the same type have already been delivered to the government-controlled Ghana Fishing Corporation, and another was to be completed shortly. This will complete the order with Norway for 7 stern trawlers.

The vessels are 231 feet 7 inches long and have a daily freezing capacity of 24 tons of fish. Refrigerated storage space in the vessels measures 35,000 cubic feet and the temperature can be kept down to below 0° F. even in tropical waters. The vessels are powered by diesel engines generating 1,960 hp., coupled to reversible propellers, with a speed of 14 knots, and can accommodate a crew of 52. (The Export Council of Norway Information Service, June 11, 1965.)

Note: See Commercial Fisheries Review, May 1965 p. 67; January 1965 p. 72.



## Iceland

## EXPORT STOCKS OF PRINCIPAL FISHERY PRODUCTS, MAY 31, 1965:

As of May 31, 1965, Iceland's stocks of frozen groundfish (fillets) for export to the United States totaled 4,880 metric tons, a decline of 2,220 tons from the stocks on hand April 30, 1965. (United States Embassy, Reykjavik, June 25, 1965.)

Icelandic Export Stocks <sup>1/</sup> of Principal Fishery Products, May 31, 1965			
Item	Quantity	Value	
	Metric Tons	Million Kr.	US\$ 1,000
<b>Groundfish, frozen:</b>			
For export to:			
U. S. . . . .	4,880	107.4	2,494.2
Other countries . . . .	3,677	63.6	1,477.0
Stockfish . . . . .	5,800	162.4	3,771.5
<b>Herring:</b>			
Salted . . . . .	-	-	-
Frozen . . . . .	1,846	10.5	243.8
<b>Industrial products:</b>			
Fish meal:			
Herring . . . . .	2,409	17.3	401.8
Other fish . . . . .	4,292	23.9	555.0
Herring oil . . . . .	7,879	65.4	1,518.8

<sup>1/</sup>Includes only stocks intended for export.

Note: Icelandic kronur 43.06 equal US\$1.00

United States imports of frozen groundfish fillets from Iceland in the year 1964 totaled 17,812 tons of groundfish blocks and slabs,

4,669 tons of cod fillets, 2,791 tons of haddock fillets, and 548 tons of ocean perch fillets.

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## UTILIZATION OF FISHERY LANDINGS, JANUARY 1965:

How Utilized	January	
	1965	1964
	. . . (Metric Tons) . . .	
<b>Herring <sup>1/</sup> for:</b>		
Oil and meal . . . . .	25,568	24,377
Freezing . . . . .	5,916	4,828
Salting . . . . .	1,491	1,108
<b>Groundfish <sup>2/</sup> for:</b>		
Fresh on ice . . . . .	3,115	3,687
Freezing and filleting . . . .	4,379	10,030
Salting . . . . .	1,314	3,608
Stockfish (dried unsalted) . . .	500	1,807
Oil and meal . . . . .	170	235
<b>Shrimp for:</b>		
Freezing . . . . .	31	20
Canning . . . . .	5	-
Home consumption . . . . .	1,330	992
<b>Total production . . . . .</b>	<b>43,819</b>	<b>50,692</b>
<sup>1/</sup> Whole fish.		
<sup>2/</sup> Drawn fish.		
Source: <u>Aeqir</u> , May 1, 1965.		

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## FISHERY LANDINGS BY PRINCIPAL SPECIES, JANUARY 1965:

Species	January	
	1965	1964
	. . . (Metric Tons) . . .	
Cod . . . . .	5,708	11,074
Haddock . . . . .	2,744	5,618
Saithe . . . . .	692	533
Ling . . . . .	442	789
Wolffish (catfish) . . . . .	144	202
Cusk . . . . .	290	930
Ocean perch . . . . .	562	646
Halibut . . . . .	49	101
Herring . . . . .	32,975	30,313
Shrimp . . . . .	36	20
Other . . . . .	177	466
<b>Total . . . . .</b>	<b>43,819</b>	<b>50,692</b>
Note: Except for herring which are landed round, all fish are drawn weight.		

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## LABOR DISPUTE IN HERRING FISHERY SETTLED:

A 5-day labor dispute involving Icelandic herring vessel captains ended on July 1, 1965, when the Prime Minister announced that an agreement had been reached by all concerned. The main provisions of the agreement were: (1) the summer price of herring for reduction would be 235 kronur (US\$5.46) per mal (150

## Iceland (Contd.):

liters which is equivalent to about 40 gallons or 300 pounds); and (2) the Government will see that exact weighing of herring landed at reduction factories will be provided by the summer of 1966. (United States Embassy, Reykjavik, July 7, 1965.)



## Italy

## TRADE IN JAPANESE CANNED SALMON LIBERALIZED:

At the bilateral trade negotiations conducted in July 1965 at Tokyo between Japan and Italy, Italy agreed to reduce the number of import items it restricts from Japan to 97, effective August 1, 1965. A total of 26 items was said to have been dropped from the restricted list, including canned salmon. (Japan Economic Journal, July 20, 1965.)



## Japan

## FROZEN TUNA EXPORTS TO U. S. AND PUERTO RICO, MARCH-MAY 1965:

Japan's exports of frozen tuna to the United States and Puerto Rico in May 1965 in-

creased 129 percent in quantity and 119 percent in value as compared with the previous month. Exports of all species of tuna were up from the April 1965 exports except big-eyed. Those to the United States proper were nearly three times more and to Puerto Rico they were double the April exports.

The April exports of frozen tuna to the United States and Puerto Rico were down 20 percent in quantity and 12 percent in value from the previous month's exports. Yellowfin tuna exports increased 69 percent from March to April, but exports of albacore were down 63 percent. (Fisheries Attache, United States Embassy, June 14 and July 7, 1965.)

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## FISH LANDINGS AT MAJOR TUNA PORT, JUNE 1965:

Landings (mainly tuna) at the Japanese port of Yaizu in June 1965 totaled 17,420 metric tons valued at 1,187 million yen (US\$5.2 million), according to the Yaizu Fishermen's Cooperative Association. Compared to June 1964, landings in 1965 dropped 7 percent (1,274 tons) due to smaller catches of mackerel and skipjack, but that was offset by the increased catch of albacore. Compared to June 1964, the albacore landings showed a sevenfold increase in quantity and a \$2-mil-

Japan's Exports of Frozen Tuna by Species to United States and Puerto Rico, March-May 1965

Species	May		April		March	
	Quantity	Value	Quantity	Value	Quantity	Value
	Short Tons	US\$1,000	Short Tons	US\$1,000	Short Tons	US\$1,000
<b>Skipjack:</b>						
United States . . . . .	-	-	-	-	2	1
Puerto Rico . . . . .	-	-	-	-	-	-
Total . . . . .	-	-	-	-	2	1
<b>Albacore:</b>						
United States . . . . .	3,399	1,013	795	237	1,270	383
Puerto Rico . . . . .	409	119	531	151	2,335	634
Total . . . . .	3,808	1,132	1,326	389	3,605	1,017
<b>Yellowfin:</b>						
United States . . . . .	3,593	1,124	2,046	683	1,303	406
Puerto Rico . . . . .	2,502	708	846	258	405	97
Total . . . . .	6,095	1,832	2,892	941	1,708	503
<b>Big-eyed:</b>						
United States . . . . .	46	12	48	12	98	24
Puerto Rico . . . . .	30	6	92	19	5	1
Total . . . . .	76	18	140	31	103	25
Total United States . . . . .	7,038	2,149	2,889	932	2,673	814
Total Puerto Rico . . . . .	2,941	833	1,469	428	2,745	732
Grand Total . . . . .	9,979	2,982	4,358	1,360	5,418	1,546

Source: Japan's Bureau of Customs.

## Japan (Contd.):

Fish Landings at Yaizu, Japan, June 1965			
Species	Landings	Value	Average Price
	Metric Tons	US\$ 1,000	\$/M.T.
Albacore . . . . .	9,575.7	2,559	267
Skipjack . . . . .	2,662.6	837	314
Other tuna . . . . .	4,542.3	1,609	354
Mackerel . . . . .	118.8	14	117
Others . . . . .	520.6	162	311
Total . . . . .	17,420.0	5,181	-

lion increase in value. (Suisan Keizai Shim-bun, July 12, 1965.)

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## SUMMER ALBACORE TUNA FISHERY CATCH:

The total catch of the Japanese summer pole-and-line albacore tuna fishery, which ended early July 1965, was estimated at 45,000 metric tons. This was an increase of about 12,000 tons over the 1964 catch. It is estimated that of the 1965 production, about 10,000 metric tons were exported to the United States in the round, 2,000 tons processed into loins for export, 8,000 tons processed into "fushi" and "namaribushi" (dried or semidried loins) for the domestic market, 23,000 tons canned, and 2,000 tons held in stock. At the beginning of the fishing season (late April), the pole-caught albacore for export to the United States sold for US\$315 a short ton f.o.b. Japan. As the season progressed and catches increased, the export price declined to \$300, then tumbled to \$270, but toward season's end as catches declined sharply the price recovered to \$295-298. (Suisan Tsushin, July 7, 1965.)

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## ATLANTIC LONG-LINE TUNA FISHERY TRENDS:

Data from the Japanese Fisheries Agency show that the tuna catch of Japan's portable-boat-carrying tuna motherships operating in the Atlantic Ocean this year declined slightly in June as compared to May. Available data from 40 portable boats showed 5 boats averaged over 3 tons a day, 9 averaged less than 1.5 tons, and 26 boats caught between 1.5-3 tons a day. But in May, 14 boats averaged over 3 tons a day, 5 boats less than 1.5 tons, with most boats averaging 1.5-2.5 tons. About 15 tuna motherships fished in June in the

area between 20°-30° N. latitude and 40°-70° W. longitude. In June albacore led all landings, followed by yellowfin, bluefin, and big-eyed; in May the principal species landed (in order of quantity) were albacore, yellowfin, big-eyed, and bluefin. (Suisan Keizai Shimbun, July 12, 1965.)

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## MOSTLY ALBACORE TUNA CAUGHT BY LONG-LINE VESSELS IN SOUTH ATLANTIC:

The tuna catch of the Japanese long-line vessels operating in the South Atlantic Ocean was mostly albacore tuna as of early July 1965. Off Angola, albacore made up about 70-80 percent of landings, averaging in weight about 13 kilograms (28 lbs.) per fish, and off Puerto Rico the catch was made up of 60-70 percent albacore.

The price of frozen round albacore transshipped to Puerto Rico was US\$290-295 a short ton f.o.b. port of transshipment. Due to the short supply of yellowfin, gilled-and-gutted yellowfin shipped to Italy were selling for \$410-415 a metric ton c. & f. (Bluefin) exported to Italy were selling for \$340 a metric ton and big-eyed at about \$280 a ton c. & f. (Suisan Tsushin, July 14, 1965.)

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## TUNA MOTHERSHIP CATCH IN SOUTH PACIFIC:

A large Japanese fishing company's tuna mothership Yuyo Maru (5,043 gross tons), which departed Tokyo May 11, 1965, began catching in July 1965 an average of 2.8 metric tons of fish (mainly tuna) per catcher vessel per day. The mothership fleet switched its effort from yellowfin to albacore tuna, and had caught as of July 11 a total of 2,374 metric tons of fish, including 1,265 tons of yellowfin, 321 tons of albacore, and 352 tons of other tuna species. (Suisancho Nippo, July 17, 1965.)

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## PLANS TO STABILIZE ALBACORE TUNA MARKET:

The Japanese Federation of Tuna Fishermen's Cooperative Association (NIKKATSUREN), the Frozen Tuna Producers Association, and the Frozen Tuna Exporters Association held a meeting on June 3, 1965, to discuss ways of coping with the unstable albacore tuna prices resulting from an over-supply of fish due to unusually heavy landings

## Japan (Contd.):

of albacore made by the summer pole-and-line fishery off Japan.

Price stabilization measures proposed at the meeting were: (1) Albacore exports from Japan proper over and above the established quota (30,000 short tons) not be permitted; (2) Atlantic albacore transshipments to the United States be limited to 36,000 short tons a year (the allocation of quotas to those engaged in the Atlantic tuna fishery be studied); (3) the minimum export price for Atlantic-caught albacore be set at US\$300 a ton f.o.b. Las Palmas (Canary Islands), and a study undertaken to determine the feasibility of establishing a sales agency to enforce the maintenance of that price--also, an export plan which takes into consideration such factors as country of destination, timing and supply, be established and a standard export price based on actual freight costs to points of destination developed; (4) promotional work aimed at increasing white meat tuna demand in the United States be launched; (5) a suitable quantity of pole-caught albacore be consigned to Japanese packers for processing into canned tuna in oil for domestic consumption, which presently totals only about 100,000 cases a year--also, extensive efforts be directed to promoting domestic demand for that product.

The three Japanese industry organizations again met on June 10 and unanimously agreed to launch a promotional campaign to stimulate domestic demand for tuna packed in oil. Based on the prediction that 50,000 metric tons of pole-caught albacore would be landed in Japan in the 1965 season, NIKKATSUREN expressed the hope that about 15,000 tons could be diverted to the domestic market. Of that quantity, NIKKATSUREN hoped that the large packers would take on consignment the packing and sale of 3,000-4,500 tons which NIKKATSUREN will purchase. One of the larger Japanese packing firms and other large packers were reported to have expressed willingness to cooperate actively in that plan but did not commit themselves as to quantity.

The Atlantic Tuna Committee of the Japanese tuna industry group (representing producers, freezers, packers, and exporters) met June 25, 1965, and agreed to establish a 36,000-short-ton Atlantic albacore export quota (for transshipment to the United States) to be allocated as follows: 30,000-ton actual performance quota (20,000 tons to be allocated

on basis of past export performance record and 10,000 tons to be allocated according to vessel-carrying capacity); 5,500-ton supplementary quota; and 500-tons for newly licensed exporters. Exporters will be permitted to freely transfer their allotted quotas among themselves. The plan was to be implemented August 1, 1965.

The Committee also adopted a plan to ship Atlantic albacore tuna to U. S. west coast packers to avoid an oversupply at Puerto Rico. Atlantic tuna vessel operators will be assessed two yen per kilogram (US\$5 a short ton) on their catch of albacore to help defray the increase in transportation costs. (Suisan Keizai Shimbun, June 4 and June 27; Suisan Tsushin, June 12, 1965.)

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## SECOND GOVERNMENT-INDUSTRY TUNA MEETING:

The Japanese Government scheduled a series of Government-industry meetings in 1965 to exchange views and to seek ways and means of strengthening the tuna industry. On June 28-29, 1965, the second series of meetings was held. Subjects discussed were international tuna fishery regulation, technical assistance to foreign countries, overseas-based fishing operations, and fishing effort. The general consensus was described as follows:

International fishery regulation: Heretofore, Japan has maintained a negative attitude toward tuna fishery regulatory proposals advanced by foreign countries. However, Japan can no longer turn her back on the current trend toward international regulation and must actively cooperate in such programs.

Overseas technical assistance: Japan should cooperate in extending basic technical assistance to other countries. She should not be wary about the expansion of tuna fishing operations by foreign countries, such as Formosa and South Korea, but must pursue a policy of utilizing high-seas resources without creating friction with those countries in order to further promote the growth of the Japanese tuna industry.

Overseas-based fishery: Ten years have elapsed since the Japanese tuna base at Samoa was established, but on an overall basis recent developments in the overseas-based fishery have not been very favorable. Other countries are beginning to direct their atten-

## Japan (Contd.):

tion to base-type operations so Japan must employ efficient vessels to compete with those countries. In view of the importance of overseas bases for operation of small fishing vessels, Japanese producers and exporters must cooperate with foreign importing firms to secure vessel supplies and recreational facilities for crew members.

**Fishing effort:** The decline in hook rate has been due to the intensification of fishing effort. Effort should be restricted but it will be difficult to assess the effect any limitations placed on Japanese effort will have without considering developments on a world-wide basis. (Suisan Keizai Shimbun, June 30, 1965.)

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CANNED TUNA IN BRINE STOCKS ON HAND:

Japan is reported to have in stock about 1.7 million cases of canned tuna in brine. Of that quantity, 1.5 million cases are said to be consigned to the Canned Tuna Sales Company and about 200,000 cases held in stock by the packers. Exports of canned tuna in brine to the United States, as of early July 1965, were reported to total about 1,240,000 cases.

The market for Japanese canned tuna in the United States was reported in early July as being very soft and export prospects for the remainder of the year not bright. (Suisan Tsushin, July 9 & 12, 1965.)

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CANNED TUNA EXPORTERS ASK SALES COMPANY FOR PRICE-QUANTITY ADJUSTMENTS IN JULY SALES:

Chairman of the Tuna Department, Japan Canned Foods Exporters Association, submitted a request in July 1965 to the Japan Canned Tuna Sales Company asking that (1) the quantity of canned tuna to be released in July be limited to a total of 100,000 cases, consisting of 50,000 cases each of white and lightmeat tuna (note: A total of 250,000 cases was offered for sale for June-July by the Sales Company); (2) a promotional allowance of US\$0.50 a case be granted for the white-meat pack; and (3) a premium of \$0.20 per case be placed on the 7-oz. and 13-oz. lightmeat packs to encourage their production.

The request was expected to be taken up for consideration by the executive board of

the Canned Tuna Packers Association. (Suisan Tsushin, July 15, 1965.)

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SALMON PACK AVAILABLE FOR EXPORT:

The land-based salmon packers in Japan were expected to have available for consignment to the Canned Salmon Sales Company for sale to foreign countries a total of 300,000 cases of pink salmon, consisting of 200,000 cases of 48  $\frac{1}{2}$ -lb. cans and 100,000 cases of 96  $\frac{1}{4}$ -lb. cans.

The companies operating the salmon mother-ships seem certain to have available for export 250,000 cases of pink salmon, consisting of 200,000 cases of 48  $\frac{1}{2}$ -lb. cans and 50,000 cases of 96  $\frac{1}{4}$ -lb. cans.

On July 16, 1965, the Canned Salmon Sales Company announced that for the first sale of canned pink salmon export prices would be:

Destination	Pack	\$/Case <sup>1/</sup>
Europe . . . . .	48 $\frac{1}{2}$ -lb. cans	<u>2/</u> 12.20
Australia-New Zealand .	" " " "	12.30
All countries . . . . .	96 $\frac{1}{4}$ -lb. cans	<u>3/</u> 13.50
1/F.o.b. Japan		
2/Former price: \$11.50/case.		
3/No change in price.		

The shipping deadline was September 30, 1965.

Reportedly, the f.o.b. export price of \$12.20 a case for the  $\frac{1}{2}$ -lb. pack, when converted to a c.i.f. price (destination Great Britain) is equal to 94 shillings 3 pence (US\$13.20). The former c.i.f. price was 89 shillings 5 pence (US\$12.52), so the new price represents an increase of \$0.68 a case.

Canadian salmon packers are reported to have offered their product (to be shipped before December 1965) to Great Britain for 97 shillings c.i.f. But since Britain on the Japanese products assesses an import duty of 5 percent, the c.i.f. price of the Japanese 48  $\frac{1}{2}$ -lb. cans actually totals about 99 shillings a case or some 2 shillings (US\$0.28) a case higher than the Canadian product. This price differential is expected to make it somewhat difficult for Japanese trading firms to sell the full amount (approximately 320,000 cases of 48  $\frac{1}{2}$ -lb. cans) of pinks to be offered for the first sale before the shipping deadline of September 30. (Suisan Tsushin, July 13 & 19, 1965.)

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Japan (Contd.):

#### NORTH PACIFIC-BERING SEA SALMON AND BOTTOMFISH TRENDS:

The 11 Japanese salmon motherships operating in the North Pacific and Bering Sea were expected to reach their catch targets (totaling 45,478 metric tons) towards the end of July 1965 and to return to Japan July 31-August 4, or about 20 days earlier than in 1964. (Suisancho Nippo, July 21, 1965.)

The Japanese Bering Sea mothership-type bottomfish fleet landed, as of July 18, 1965, about 200,200 metric tons of fish, equal to 51 percent of the combined target of 390,000 tons. (Suisancho Nippo, July 21, 1965.)

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#### KING CRAB PRODUCTION TRENDS:

The four Japanese king crab factoryships operating in the Okhotsk Sea were averaging 21.4 crabs a shackle and had packed a total of 205,536 cases as of July 8, 1965. That was equal to 86 percent of their production target of 240,000 cases (48  $\frac{1}{2}$ -pound cans).

The two Japanese crab factoryships, Tainichi Maru (5,859 gross tons) and Tokei Maru (5,385 gross tons), operating in Bristol Bay packed a total of 126,535 cases as of the same date, equal to 68 percent of their combined target of 185,000 cases. They averaged 11.7 crabs a shackle. (Suisan Tsushin, July 12, 1965.)

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#### FIRM TO USE LARGER TRAWLER FOR GULF OF ALASKA FISHERY:

The Japanese fishing company which was scheduled to use the 560-ton trawler Tatsuta Maru (accompanied by the 276-ton trawler Fukuho Maru) in the Gulf of Alaska in 1965 decided to cancel that vessel's operation and to use a 3,000-ton trawler instead.

The Tatsuta Maru was originally scheduled to fish for shrimp off Kodiak. The vessel is not considered suitable for other types of operation elsewhere in the Gulf due to its small size and consequently will be replaced by a larger vessel. Ten other large Japanese trawlers, accompanied by either 1 or 2 smaller trawlers, are licensed for operation in the northeastern Pacific this year, but those 10 vessels range in size from 1,500-3,000 tons.

(Suisan Tsushin, July 9; Suisan Keizai Shimbun, June 2, 1965.)

\* \* \* \* \*

#### BERING SEA SHRIMP FISHERY TRENDS:

The Japanese factoryship fleets operating in the Bering Sea and engaged in the production of canned shrimp reported poor fishing as of early July 1965. The factoryship Einin Maru (7,491 gross tons) is said to have produced about 60 percent of the quantity she produced a year earlier for the same period. By season's end, that factoryship's canned shrimp production is expected to total 250,000-300,000 cases. Estimated shrimp production figures for the factoryship Chichibu Maru (7,472 gross tons) were not available but that factoryship also reported poor fishing. (Suisan Tsushin, July 13, 1965.)

\* \* \* \* \*

#### FIRM PLANS TO OPERATE LARGE TRAWLER IN NORTHWEST ATLANTIC:

A large Japanese fishing company has decided to dispatch a 3,000-ton trawler to the northwest Atlantic in winter 1966. The trawler, to be newly constructed, is scheduled to be based at St. Pierre Island off Newfoundland and will fish for cod. The catch will be processed into fillets on board ship and exported to the United States. In 1963/64 the same firm operated the stern trawler Tenyo Maru No. 3 (3,698 gross tons) in the northwest Atlantic but the vessel, which was a conversion job, was found unsuitable for operation in those waters. (Shin Suisan Shimbun Sokuho, July 8, 1965.)

\* \* \* \* \*

#### FISHING VESSELS IN ATLANTIC TO BE REFUELED AT SEA BY TANKER:

The 900-ton Japanese oil tanker Shotoku Maru (chartered by a trading firm for refueling fishing vessels at sea in the Atlantic Ocean) was scheduled to depart Japan in mid-July 1965. Initially the tanker was to serve tuna long-liners and trawlers operating in waters off South America. Should the tanker operate out of Venezuela, the fuel cost to the participating fishing vessels is expected to run about 17,000 yen a kiloliter (US\$0.18 a gallon). The Shotoku Maru was also expected to supply provisions, fresh water, and engine parts to the Japanese vessels. (Suisan Keizai Shimbun, July 1, 1965.)

\* \* \* \* \*



## Japan (Contd.):

**LARGE FISHERY STERN-TRAWLER RESEARCH VESSEL PLANNED:**

The Japanese Fisheries Agency is developing specifications for a 2,000-ton stern-trawler research vessel. The vessel is to be constructed over a 3-year period at a total cost of 1,097 million yen (US\$3 million). For FY 1965 (April 1965-March 1966) about 200 million yen (\$555,000) have been budgeted. If funding permits, a 2,600-ton vessel may be constructed.

The research vessel will be a stern trawler type and will carry two 15-meter (49-foot) long portable boats for tuna long-lining. It will have an electrical propulsion system (to facilitate research) capable of developing a maximum speed of 15 knots, and a cruising range of 10,000 nautical miles. It will be equipped with 75 bunks, 6 experimental rooms, and 4 freezing rooms. (Suisancho Nippo, July 19, 1965.)

\* \* \* \* \*

**EXPORTS OF FROZEN RAINBOW TROUT, MAY 1965:**

Japan's exports of frozen rainbow trout in May 1965 amounted to 226 short tons valued at US\$167,553. The quantity shipped in May was only slightly more than the 222 tons valued at \$171,403 exported the previous month.

Japan's Exports of Frozen Rainbow Trout by Country of Destination, May 1965		
Destination by Country	Quantity	Value
	Short Tons	US\$
United States . . . . .	125	94,211
United Kingdom . . . . .	38	24,859
Hong Kong . . . . .	2	2,047
Belgium . . . . .	18	14,242
Canada . . . . .	22	16,625
Australia . . . . .	3	2,198
Sweden . . . . .	3	2,353
Netherlands . . . . .	13	8,992
Other . . . . .	2	2,026
Total . . . . .	226	167,553

Source: Japan's Bureau of Customs.

The United States continued during both April and May as the leading export market for that product. (Fisheries Attache, United States Embassy, Tokyo, July 7, 1965.)

\* \* \* \* \*

**DOMESTIC FISH MEAL MARKET TRENDS:**

Japanese livestock producers agreed to purchase from the fishing companies operating fish-meal factoryships in the eastern Bering Sea their production of fish meal for 73,000 yen (US\$203) a metric ton. This was an increase of 9,250 yen (\$25.69) a metric ton over the price paid for factoryship-produced meal in spring 1965.

A Japanese trading firm contracted to deliver to a European firm 600 metric tons of factoryship-processed fish meal for US\$214 a metric ton, c.i.f. Rotterdam. Shipping period was to be September-October 1965. The meal was to be transported aboard a Japanese tanker scheduled to deliver whale oil to Europe. Consequently, the transportation cost was expected to be very low. In essence this means that the fishing companies operating the fish-meal factoryships received a better price than the \$203 a ton paid by the Japanese livestock producers. (Suisan Tsushin, July 20; Suisancho Nippo, July 17, 1965.)

\* \* \* \* \*

**FISH MEAL PRICES INCREASE FOR DOMESTIC OFFERINGS OF FACTORYSHIP PRODUCTION:**

The three major Japanese fishing companies operating fish-meal factoryships in the eastern Bering Sea have offered to sell their production on the domestic market for 73,000 yen (US\$203) a metric ton. In the spring of 1965, one of the three firms was selling fish-meal for 63,750 yen (\$177) a ton, but Japanese prices increased with the rise in prices for Peruvian fish meal. About 31,000 to 32,000 tons of Japanese factoryship-produced meal are expected to be available for release in the last half of 1965. (Suisan Tsushin, June 25, 1965.)

\* \* \* \* \*

**HOKKAIDO FISHERMEN PROTEST JOINT SOVIET-JAPANESE OKHOTSK SEA FISH-MEAL OPERATIONS:**

Representatives of the Hokkaido fishing industry called on the Japanese Fisheries Agency Director on June 21, 1965, to protest the plans of major Japanese fishing firms to cooperate with the Soviet Union in joint fish-meal operations in the Okhotsk Sea. In the spring of 1965 one large Japanese firm, under an agreement concluded in December

## Japan (Contd.):

1964, successfully conducted such an operation. After a rendezvous in the Okhotsk Sea, its fish-meal factoryship was supplied with Alaska pollock caught by Russian trawlers. Subsequently, other major Japanese firms have shown great interest in engaging in such an operation, in part to offset their reduction in whaling effort in the Antarctic Ocean. It has been reported that this conflict may be settled on a political level in the fall of 1965. (Suisancho Nippo, June 22, 1965, and other sources.)

Note: See Commercial Fisheries Review, May 1965 p. 76.

\* \* \* \* \*

NORTH PACIFIC SPERM WHALE STUDY:

The Japanese Government's Whale Research Institute is planning to conduct an ecological and biological study of sperm whales in the North Pacific. Under the plan, which has been approved by the Fisheries Agency, 5 whale catcher vessels from a large Japanese fishing company will be delegated the task of collecting the scientific data. The vessels were scheduled to conduct the studies beginning in mid-August 1965 and would operate mainly off Hokkaido. Japan hopes to gain data on herd, length, and age composition to present to the International Whaling Commission in connection with the problem on harvestable sizes of sperm whales. (Suisan Keizai Shimbum, July 2, 1965.)

\* \* \* \* \*

ANTARCTIC WHALING FLEET PRESEASON OPERATION OUT OF SOUTH GEORGIA ISLAND:

A Japanese whaling firm, which has a three-year agreement (beginning in 1964) to conduct whaling operations out of South Georgia Island, has decided to change its operational plans for this year (1965/66 season) and operate a whaling fleet out of that base for about 2½ months prior to the opening of the Antarctic whaling season. Under this change, the whale catchers and support vessels assigned to the South Georgia Island base will be transferred to Antarctic whaling in mid-December 1965, thereby assuring their maximum and most efficient use. (Suisan Tsushin, June 25, 1965.)

\* \* \* \* \*

WHALE MEAT TO BE PURCHASED FROM NORWEGIAN WHALING FLEET:

A large Japanese fishing company has signed a provisional agreement to purchase whale meat from a Norwegian whaling fleet during the 1965/66 Antarctic whaling season. Under the agreement, the Japanese firm will charter to the Norwegian Kosmos IV fleet, 5 catcher vessels (including crews) at 255 million yen (US\$708,000) to harvest the equivalent of 255 blue-whale units. The whales will be processed on the Norwegian factoryship and their meat sold back to the Japanese firm for 60,000 yen (US\$167) a metric ton. (Suisan Tsushin, July 9, 1965.)

\* \* \* \* \*

WHALE OIL SALES AGREEMENT FOR DOMESTIC MARKET:

The Japanese whaling firms engaged in whaling in the North Pacific and Bering Sea have concluded a contract to sell 7,000 metric tons of their 1964/65 production of fin whale oil for 89,000 yen (US\$247) a metric ton to domestic buyers. (Suisancho Nippo, June 22, 1965.)

\* \* \* \* \*

IMPORTS OF MARINE PRODUCTS INCREASING:

The value of Japanese imports of fishery products, which stood at ¥8,030 million (US\$22.3 million) in 1961 and ¥7,810 million (\$21.7 million) in 1962, increased to ¥16,160 million (\$44.9 million) in 1963 and in 1964 rose to ¥25,590 million (\$71 million).

Major import items have been fish meal from Peru, octopus and cuttlefish from Spain, and shrimp and spiny lobsters from Mexico and Communist China.

Observers ascribe the increasing imports to the following causes:

(1) A decline in domestic production of fishery products since 1962.

(2) Liberalization of import regulations for marine products.

Rising imports of marine products have been particularly noticeable since the start of 1965. Under barter arrangements completed in early 1965, 9,000 metric tons of fish-

## Japan (Contd.):

ery products--chiefly herring and salmon--will be imported from the Soviet Union during the year in exchange for exports of Japanese apples.

Imports of dried cuttlefish and dried laver are expected from South Korea in the wake of normalization of diplomatic relations between Japan and the Republic of Korea.

An import contract for raw fish was concluded by a Japanese trading house with Communist China at the end of May 1965. Under the contract, 8,000 tons of raw fish are to be shipped to Japan in the fall of 1965.

The rising trend in imports has disturbed Japan's coastal fishermen. On the ground that increasing imports of fishery products are imposing pressure on small-scale fishing operations in coastal waters, the All-Japan Federation of Fishing Cooperatives is expected to ask the Government for steps to adjust imports of marine products. (The Japan Economic Journal, June 29, 1965.)

\* \* \* \* \*

#### CANNED FISHERY PRODUCTS IN SHORT SUPPLY ON DOMESTIC MARKET:

Following is a report published in Kanagawa Shimbun, June 26, 1965, describing a shortage of canned fishery products on the Japanese domestic market:

Mackerel, crab, salmon, tuna, and bonito are among the canned products in short supply on the Japanese domestic market. The shortage is due to declining catches in coastal waters and also in offshore fisheries subject to international regulation, such as the salmon fishery. In addition, for species such as tuna and salmon, the Japanese domestic market meets strong competition from export sales.

Mackerel is the most critical item on the list, with a maximum pack of only 350,000 cases forecast this year, as compared with 1.3 million cases last year. The pack of crab is also expected to be down sharply in 1965.

The average price of canned fishery products on the Japanese domestic market has already increased 10 to 15 percent over the 1964 price level and may increase another 10 percent.

\* \* \* \* \*

#### COMMUNIST CHINA PROTESTS ILLEGAL FISHING BY JAPANESE VESSELS:

In a strongly worded letter dated June 7, 1965, to the Japan-China Fishery Association in Japan, the Communist China Fishery Association sharply criticized the fishing activities of Japanese fishing vessels operating off the Chinese coast. The letter charged that over 20 Japanese vessels had been operating illegally in waters closed to fishing under the terms of the private fishery agreement concluded between Japan and Communist China in November 1963, and demanded prompt withdrawal of the offending vessels in the interest of Japanese-Chinese friendship. It also demanded assurance that the Japanese will not commit such infractions in the future. It was reported to be the third time that the Communist Chinese have protested against illegal fishing by Japanese vessels.

The Japan-China Fishery Association, concerned over the future of the private fishery agreement, informed the Communist China Association that Japan would immediately issue warnings to all Japanese fishing vessels and would call a special meeting to study suitable measures to cope with the problem. (Suisan Keizai Shimbun, June 11, 1965.)



#### Republic of Korea

#### PROGRESS ON FISHING FLEET BEING BUILT BY FRENCH-ITALIAN CONSORTIUM:

By April 1, 1965, ten 98-foot tuna vessels of 140 gross tons had been launched for Korea by a French-Italian consortium under a contract signed January 21, 1963, and amended December 11, 1963, and February 3, 1964. One of the new tuna long-line vessels sailed for Korea in the spring of 1965, and the others were expected to follow in a short time.

Over 90 vessels are to be built for Korea by the French-Italian consortium, including trawlers as well tuna vessels. Construction has already begun under the contract on two 253-foot stern trawlers, each of which will have a frozen fish hold capacity of 31,784 cubic feet. One of the stern trawlers is scheduled for completion in December 1965 and the other in February 1966. (The Fishing News, June 11, 1965.)

Note: See Commercial Fisheries Review, May 1965 p. 81, and Dec. 1964 p. 105.



## Malaysia

### EXPANSION OF SINGAPORE TUNA INDUSTRY PLANNED:

The Singapore Economic Development Board announced earlier this year that it was prepared to invest US\$25 million to develop a tuna fishing industry, based on survey reports by two French consultants who came to Singapore at the invitation of the Board. The Board will provide technical information and financing for the construction of fishing vessels and loans for the purchase of fishing gear. They hope to export both canned and frozen tuna. (United States Consulate, Singapore, April 16, 1965.)

\* \* \* \* \*

### TUNA FISHING VESSELS BEING PURCHASED FROM JAPAN:

An application to export from Japan 7 used fishing vessels (3 vessels of 350 to 390 tons, 2 of 220 to 260 tons, and 2 of 180 tons) to Malaysia was approved in June 1965, by the Japanese Fisheries Agency. Two of the vessels are expected to be used for training purposes and the remaining 5 for tuna fishing.

The vessels were to be sold to the jointly operated Japanese-Malayan company at Penang which is engaged in the production of frozen and canned tuna. The firm is purchasing the vessels to assure itself of a regular supply of raw material. (Suisan Keizai Shimbun, June 20, 1965.)

Note: See Commercial Fisheries Review, April 1965 p. 77.



## Mexico

### IMPORTS OF MARINE OIL, 1963-1964:

Cod oil is the main item in Mexican imports of marine oil, and the leading suppliers

Mexican Imports of Marine Oil, 1963-1964		
Commodity & Country	1964	1963
	. (Metric Tons) .	
<b>Sperm oil:</b>		
United States . . . . .	2.9	1.2
United Kingdom . . . . .	11.1	12.0
Other countries . . . . .	5.1	1.8
Total sperm oil . . . . .	19.1	15.0
<b>Whale, seal, and shark oil:</b>		
United States . . . . .	52.2	99.9
United Kingdom . . . . .	80.3	78.4

(Table continued on next column.)

Commodity & Country	1964	1963
	. (Metric Tons) .	
Germany . . . . .	10.1	65.2
Other countries . . . . .	21.0	10.7
Total whale, seal, and shark oil . .	163.6	254.2
<b>Cod oil:</b>		
United States . . . . .	138.4	141.1
Norway . . . . .	706.6	498.5
United Kingdom . . . . .	134.2	45.4
Other countries . . . . .	60.6	22.0
Total cod oil . . . . .	1,039.8	707.0
<b>Fish-liver oil:</b>		
Ireland . . . . .	27.7	38.8
Other countries . . . . .	-	0.2
Total fish-liver oil . . . . .	27.7	39.0

are Norway, the United States, and the United Kingdom. In 1964, an increase in imports of cod oil more than offset a decline in imports of whale, seal, and shark oil. (Agricultural Attache, United States Embassy, Mexico, D.F., May 21, 1965.)



## New Zealand

### SCALLOP INDUSTRY:

New Zealand has hopes of establishing an export market for its developing scallop fishery. The New Zealand scallop (*Pecteus novaezelandiae*) grows to a size of 6 inches across the shell.

The New Zealand scallop fishery began in 1960. At that time, the Government issued licenses to a limited number of operators to take scallops off South Island in the vicinity of Nelson and Kaipara Harbor. The fishery is still closely regulated by the Government. Scallop shucking at sea is prohibited to avoid any damage to fishing grounds that might result from dumping shells overboard. A problem in the New Zealand industry is the lack of clear knowledge about the extent of the resource. Also, the high price levels now prevailing for limited production make scallops a luxury item in New Zealand. (New Zealand Commercial Fishing, June 1965.)



## Norway

### CANNED FISH EXPORTS, JANUARY-MARCH 1964-1965:

Preliminary data show that Norway's total exports of canned fishery products in Jan-

## Norway (Contd.):

January-March 1965 were up about 24 percent from the same period of the previous year due mainly to larger shipments of smoked small sild and brisling.

Norwegian Exports of Principal Canned Fishery Products, January-March 1964-1965		
Products	Jan. 1-Mar. 27 1965	Jan. 1-Mar. 28 1964
	..... (Metric Tons) .....	
Brisling .....	1,773	1,437
Smoked small sild ...	3,763	2,835
Kipperd herring .....	879	716
Soft herring roe .....	56	101
Sild delicatessen .....	157	106
Shellfish .....	287	413
Other fishery products ..	644	484
Total .....	7,559	6,092

The Norwegian 1965 canning season for small sild was scheduled to begin May 1. The brisling canning season was to open May 19 if the brisling met certain standards of size and quality. (Norwegian Cannery Export Journal, May 1965.)

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#### HERRING FISHERY TRENDS IN THE NORTH SEA AREA, JANUARY-MAY 1965:

In January-May 1965, the total Norwegian catch of North Sea herring amounted to 1,025,000 hectoliters (95,325 metric tons), or almost 3 times more than in the same period of 1964. The increased catch of North Sea herring this year has partly been offset by reduced landings of other species of fish (sand eel and Norway pout) for reduction purposes. However, in the first 5 months of 1965, total deliveries of fish to Norwegian reduction plants in the North Sea area were 87 percent higher than in the same period of 1964. A substantial part of the Norwegian purse-seine fleet was attracted to the herring fishery in the North Sea. (United States Embassy, Oslo, July 8, 1965.)

\* \* \* \* \*

#### HIGHER LOAN CEILING APPROVED FOR STATE FISHERIES BANK:

The Norwegian Storting has increased the lending ceiling of the State Fisheries Bank to 80 million kroner (US\$11.2 million) following unanimous recommendations by the Fisheries Committee as well as the Finance Committee. That represents an increase of 20 million kroner (\$2.8 million) in the loan ceiling. (United States Embassy, Oslo, July 8, 1965.)

\* \* \* \* \*

#### FISHERIES EXHIBITION, AUGUST 19-29, 1965:

Norway's King Olav V opened his country's 2nd Official Fisheries Fair in Trondheim, August 19-29, 1965. The Fair was sponsored by the Norwegian Ministry of Fishing and organized by the Norwegian Trade Fairs Organization.

The 175 exhibitors from Norway and abroad who participated in the Fair gave a broad picture of technical developments in fisheries all over the world. Important sections of the Fair were devoted to: (1) processing of fishery products, (2) machinery, (3) fishing gear, (4) vessel equipment, and (5) technical aids to navigation.

\* \* \* \* \*

#### AIR-BUBBLE CURTAIN EXPERIMENTS PROVE EFFECTIVE:

Experiments conducted by the Norwegian Society for Industrial and Technical Research (SINTEF) show that a "wall" of rising bubbles, made by pressing air through a perforated hose at the sea bottom, will stop fish just as effectively as a fishing net. By moving the hose, 50 coalfish in a 9-foot water tank were driven into a corner, and not even a frogman could scare any of the fish through the air barrier. SINTEF is now trying to make the technique economically feasible for the commercial fisheries. The Norwegian fiords were believed especially well suited for the new method. By installing a hose and an air compressor at the mouth of the fiord, a fence could be "switched on" as soon as one of the large, seasonal shoals of fish moves in. (The Export Council of Norway Information Service, June 11, 1965.)



#### Territory of Papua and New Guinea

##### FREEZING AND PROCESSING PLANT FOR SPINY LOBSTERS OPENS:

A freezing and processing plant for spiny lobsters costing £A8,000 (US\$17,900) was opened earlier this summer on Yule Island, one of the Pacific Islands in the Territory of Papua and New Guinea. The area is considered one of the Territory's major spiny lobster grounds.

The plant is owned by a Papua-New Guinea fishing organization (Fishing Society) which plans to build up a spiny lobster industry for

## Territory of Papua and New Guinea (Contd.):

export to Australia, the United States, and Europe. The Society was formed in 1961 to develop the commercial potential of the spiny lobster runs that occur each year between October and April. (Australian Fisheries Newsletter, July 1965.)



## Peru

## FISH OIL EXPORTS, JANUARY-APRIL 1965:

Exports of fish oil (crude and semirefined) from Peru during the first 4 months of 1965 totaled 70,100 metric tons, almost twice the 35,300 tons exported in January-April 1964. Much of the increase was due to larger shipments to the Netherlands (up from 14,300 tons to 47,200 tons). The shipments in 1965, however, include quantities destined for Dutch storage warehouses. Shipments to West Germany also rose from 8,800 tons to 12,200 tons. (Foreign Agriculture, July 12, 1965, U. S. Dept. of Agriculture.)



## Portugal

CANNED FISH EXPORTS,  
JANUARY-MARCH 1965:

Portugal's total exports of canned fish in oil or sauce in the first quarter of 1965 were up 18 percent from those in the same period of the previous year, due mainly to larger sardine shipments.

Portuguese Canned Fish Exports, January-March 1964-1965				
Product	1965		1964	
	Jan.-Mar.		Jan.-Mar.	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
<u>In oil or sauce:</u>				
Sardines . . . . .	17,485	920	14,055	739
Chinchards . . . . .	392	20	674	35
Mackerel . . . . .	1,010	40	878	34
Tuna & tunalike . . . .	411	14	360	11
Anchovy fillets . . . .	1,020	102	1,138	114
Others . . . . .	154	8	245	12
Total . . . . .	20,472	1,104	17,350	945

Portugal's principal canned fish buyers in the first quarter of 1965 were Germany with 4,665 metric tons, the United Kingdom with 2,417 tons, Italy 2,619 tons, France 1,710 tons,

the United States 1,503 tons, and Belgium-Luxembourg 1,494 tons. Germany's purchases of canned fish from Portugal in the first quarter of 1965 increased 44 percent from those in January-March 1964. Purchases by Italy were also up. But purchases by the United States and France were down. (Conservas de Peixe, May 1965.)

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CANNED FISH PACK,  
JANUARY-MARCH 1965:

The Portuguese pack of canned fish in oil or sauce in the first quarter of 1965 totaled 307,000 cases (mostly sardines and anchovy fillets). The Portuguese pack is traditionally

Portuguese Canned Fish Pack, January-March 1964-1965				
Product	1965		1964	
	Jan.-Mar.		Jan.-Mar.	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
<u>In oil or sauce:</u>				
Sardines . . . . .	2,249	118	3,358	177
Chinchards . . . . .	79	4	225	11
Mackerel . . . . .	179	7	198	8
Tuna & tunalike . . . .	365	12	998	33
Anchovy fillets . . . .	1,463	146	1,008	101
Others . . . . .	385	20	218	11
Total . . . . .	4,720	307	6,005	341

light in the first quarter, since the main canning season begins later in the year. (Conservas de Peixe, May 1965.)



## Senegal

## CANNED FISH INDUSTRY:

One of the purposes of Senegal's first 4-year development plan, which ended July 1, 1965, was the establishment of a fish-canning industry.

Senegal now has 5 fish-canning plants with a total processing capacity of about 30,000 metric tons. But it is estimated that Senegal's 1964 production of canned fish amounted to only about 15,000 tons, almost all of which was canned tuna. Senegal hopes to expand tuna exports to Europe and North America. One Senegalese cannery has decided to pack sardines, of which about 2,000 tons annually are landed at Dakar. The firm plans to can sardines in either oil or tomato sauce for African markets, and sardine fillets for export to Europe.



## Senegal (Contd.):

Fish processing is also carried out in Senegal by a number of small firms which are engaged mainly in smoking, salting, and cooking fishery products.

Senegal's fishing fleet comprises three groups: proas (Malay-type sailing vessels), tuna vessels, and trawlers. Of the country's present annual catch of about 100,000 tons, about 80,000 are taken by proas, 15,000 by tuna vessels, and 5,000 by trawlers. (*The Fishing News*, June 18, 1965.)

Note: See *Commercial Fisheries Review*, Jan. 1965 p. 86 and Feb. 1965 p. 82.



## South Africa

## PRODUCTION OF LEADING PROCESSED FISHERY PRODUCTS, 1963-1964:

Record production of fish meal and fish-body oil in 1964 was reported by the South

Production of Leading Processed Fishery Products in the South Africa Republic and the Territory of South-West Africa, 1963-1964

Product	Unit	South Africa		South-West Africa		Total South Africa and South-West Africa	
		1964	1963	1964	1963	1964	1963
<b>Canned:</b>							
Pilchard . . . . .	Short tons	2,332	8,445	62,130	32,053	64,462	40,498
Maasbanker . . . . .	"	1,527	2,090	-	-	1,527	2,090
Mackerel . . . . .	"	8,152	1,719	-	-	8,152	1,719
Spiny lobster . . . . .	"	-	1/	164	1/	164	1/
<b>Frozen:</b>							
Spiny lobster tails	Short tons	2/3,325	1/	2,730	1/	6,055	1/
Pilchard . . . . .	"	-	1/	1,020	1/	1,020	1/
<b>Industrial:</b>							
Fish meal . . . . .	Short tons	108,803	3/	175,186	3/	283,989	4/262,600
White fish meal . . . . .	"	9,320	1/	-	-	9,320	1/
Fish-body oil . . . . .	Long tons	21,857	3/	48,159	3/	70,016	4/46,678
Whale oil . . . . .	"	4,122	5,886	-	-	4,122	5,886
Sperm oil . . . . .	"	10,778	10,780	-	-	10,778	10,780

1/ Data not available.  
2/ Estimated.  
3/ Breakdown not available.  
4/ Revised.



Fig. 1 - Unloading South African frozen spiny lobster tails at New York City dock.



Fig. 2 - A pilchard-maasbanker cannery and industrial products plant situated on the St. Helena Bay Coast.

Africa Republic (includes the Territory of South-West Africa). There was also a sharp increase in the 1964 pack of canned pilchard. Those increases were due mainly to greater production in South-West Africa.

In 1964, whale oil output was down, while sperm oil production was at about the same level as in 1963. (*United States Consulate*, Cape Town, July 2, 1965; and other sources.)

Note: See *Commercial Fisheries Review*, Nov. 1964 p. 110.



## South Africa Republic

## SHARK FISHERY EXPANDS:

Shark fishing is becoming an increasingly important industry off the Cape coast. Four fishing vessels of one firm unloaded about 2,400 sharks in Cape Town during a week in June 1965. A spokesman for the firm said the sharks were being exported to Italy. (*South African Digest*, June 25, 1965.)

Note: See *Commercial Fisheries Review*, June 1965 p. 78.



## Spain

## FROZEN FISH WINS CONSUMER ACCEPTANCE:

Frozen hake is becoming increasingly popular in Spain. Marketing has been added by the efforts of freezer-trawler operators and retail fish markets to deliver a high-quality product.

The growing use of freezer-trawlers by Spanish firms is rapidly increasing the supply of frozen fish. (Fisheries landings at the

## Spain (Contd.):

port of Vigo in January-March 1965 included 8,550 metric tons of frozen fish--mostly small hake--which was more than double the frozen fish landings at Vigo in the first quarter of 1964.)

In keeping with the current trend, retail fish markets in southern Spain have added special stalls for the sale of "frozen-on-board-ship" hake. Each stall has a large frozen-storage cabinet and an electric band-saw. This allows the customer to buy cut-to-order frozen steaks. The frozen headless hake (which weigh from about 1 to 5 pounds) are usually sliced into steaks about  $\frac{1}{2}$ -inch thick. They are sliced with an oblique cut which gives a larger steak than the regular cross-section cut. The retail price of the hake range from about 24.5 U.S. cents a pound for the smaller sizes to 38.5 cents a pound for the larger sizes.

The new fishing and marketing techniques are changing the long-established "fresh-fish" preference of Spanish housewives. (Fish Trades Gazette, London, June 19, 1965.)



## Taiwan

### TUNA VESSEL CONSTRUCTION MATERIALS TO BE PURCHASED FROM JAPAN:

The Formosan Government is planning the construction of 15 200-ton tuna vessels with the construction materials to be purchased from Japan. Under the plan, all the shipbuilding materials, including marine engines, will be imported from Japan and assembled in Formosa. The Cooperative Bank of Formosa is said to have committed a 60-percent vessel construction loan totaling 60 million yen (US\$1.5 million) for this program. (Suisan Keizai Shimbun, July 2, 1965.)

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### TUNA VESSELS ORDERED FROM JAPAN:

A Japanese fishing vessel shipbuilding firm has received a construction order for 20 distant-water tuna vessels from Taiwan. Details are not available and the Japanese shipbuilding firm denies having received such an order, but it is reported that a number of Japanese trade representatives in Taiwan filed similar reports concerning the placement of such a

vessel order. (Suisan Keizai Shimbun, July 20, 1965.)



## U.S.S.R.

### FREEZER-TRAWLERS "PAVLOVO" AND "PRILUKI" BUILT FOR SOVIETS BY DANISH SHIPYARD:

The freezer-trawlers M/S Pavlovo and M/S Priluki were launched June 29, 1965, by a shipyard in Copenhagen, Denmark, for V/O Sudoimport, Moscow. The vessels are part of a series of 15 freezer-trawlers for the U.S.S.R. being built by the Danish shipyard



The M/S Pavlovo and M/S Priluki in construction dock at Copenhagen.

to the following specifications: length between perpendiculars 91 meters (298.5 feet), breadth 16 meters (52.5 feet), and deadweight tonnage 2,550 to 2,600 metric tons. The first in the series was the M/S Skryplev launched May 10, 1962. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, July 14, 1965.)

Note: See Commercial Fisheries Review, June 1965 p. 79.

\* \* \* \* \*

## U.S.S.R. (Contd.):

**BIG INCREASE IN FISHING FLEET AND CATCH PLANNED DURING 1966-70:**

The Soviet Union is reported to be finishing the blueprint for the development of her fishing fleet under the 5-Year Plan 1966-1970. During that period, additions are to include over 200 support vessels such as freezer-ships, transport vessels, factoryships, and motherships. Emphasis will be on the 43,000-ton displacement Vostock-class motherships. In addition, over 13 different types of fishing vessels will be constructed, including a large factory-trawler (with a displacement of about 7,000 tons) powered by an engine developing 6,000 horsepower and providing a cruising speed of 14 knots. The large trawler will carry freezing and canning equipment.

The Soviet Fisheries Minister announced in an article in Vodnii Transport, July 1965, that the increased number of fishing vessels and continued expansion into new fishing areas are expected to allow the U.S.S.R. to bring her yearly catch to 10 million metric tons by 1970, almost double the 1964 catch.

**United Kingdom****NEW FREEZER-TRAWLER "VICTORY" LANDS BLOCKS OF WHOLE FROZEN FISH:**

After completing her maiden voyage on June 11, 1965, the new British stern-fishing freezer-trawler Victory delivered to Grimsby a catch of almost 540 long tons of ground-fish, most of which was frozen into blocks of whole fish. Included were 11,074 frozen blocks of cod, 464 of lingcod, 346 of ocean perch, 252 of catfish, and 258 of unclassified fish. The fish blocks were unloaded with an elevator-conveyor unit similar to that used to unload bananas from cargo vessels.

The Victory is the first of 6 large freezer-trawlers ordered from British shipyards by a British fisheries group at a cost of about £3.0 million (US\$8.4 million).

The Victory is equipped with 10 vertical-plate freezers. It has a diesel-electric propulsion system which develops 2,700 b. hp. Main specifications of the vessel are length overall 244 $\frac{3}{4}$  feet, length between perpendiculars 215 feet, moulded depth



Fig. 1 - New freezer-trawler Victory docked at Grimsby.



Fig. 2 - Frozen blocks of whole fish being unloaded from Victory. Note elevator-conveyor unit used to remove blocks from the vessel.

to upper deck 27 $\frac{1}{4}$  feet, and moulded breadth 41 feet.

Note: See Commercial Fisheries Review, May 1964 p. 73; March 1964 p. 76.

\* \* \* \* \*

United Kingdom (Contd.):

#### FREEZER-TRAWLERS EMPHASIZED IN DISTANT-WATER FISHERIES:

A total of 22 British freezer-trawlers should be operating by mid-1966. The search for increased productivity to overcome declining yields has led the British to emphasize freezer-trawlers for distant-water fishing. The British White Fish Authority has contributed substantially to the heavy capital investment involved in changing to freezing at sea. During the fiscal year ending March 31, 1965, White Fish Authority grants to the distant-water fleet totaled nearly £1.25 million (US\$3.5 million) and loans £113,000 (\$316,400). It is expected that the use of those vessels will arrest the declining catch of the distant-water fleet, which fell by 8 percent to 336,000 long tons during the past fiscal year, and result in greater price stability.

A strong plea for the control of fishing in international waters was made on June 30, 1965, by the Chairman of the White Fish Authority, as he presented the Authority's report for the year ending March 31, 1965. He said that stocks of fish in North Atlantic waters were being hard hit by a rapid growth in the fishing effort, particularly by Soviet-Bloc countries, and that this not only depleted the stocks but increased fishing costs. (United States Embassy, London, July 9, 1965.)

\* \* \* \* \*

#### CONFERENCE ON DESIGN OF FISHING VESSELS AND THEIR EQUIPMENT IN RELATION TO FISH QUALITY IMPROVEMENT:

A Conference on the Design of Fishing Vessels and Their Equipment in Relation to Improvement of Quality was held in London, May 31-June 1, 1965, under the sponsorship of the British White Fish Authority. Over 200 delegates attended, giving representation to most European countries, the United States, and several more distant areas. The Conference coincided with the 1965 World Fishing Exhibition in London. The meeting focused on ways to maintain fish quality on vessels at sea. Sessions of the meeting were devoted to the following topics:

(1) Design and operation of fishing vessels for stowing the catch on melting ice. (Fish handling, stowage, and unloading were discussed as well as vessel design.)

(2) Other chilling techniques such as chilled sea water, superchilling, antibiotic ice, and gas stowage.

(3) Freezer trawlers and their equipment.

(4) Factory trawlers and motherships. (The discussion extended to the freezing of whole fish and fillets at sea, offal processing, and the economic size of factoryships and catcher vessels.)

The subject under discussion at each session was developed by introductory papers and then amplified by allied papers, comments, and a general discussion. The scientific approach in the introductory papers was balanced by comments of fishing industry and manufacturers representatives.

The discussions at the Conference brought out some of the trends in fish preservation at sea on European vessels. On short trips, bulk stowage of fish in ice is still the general practice, but boxing fish at sea is winning favor. Good results with antibiotic ice were reported by one trawler fleet operator. Stowage in chilled sea water is not making any advance. It was pointed out that transferring catches at sea may affect quality if the catch remains long in the sea before being picked up.

Freezing fish at sea is well accepted as a means of producing quality fish, but there is disagreement over techniques. Freezing whole fish at sea is the usual method of British freezer trawlers, while operators from most other European countries favor processing and freezing fillets at sea. Superchilling the catch as an alternative to freezing fish at sea may be useful on some vessels working in the North Atlantic. The Portuguese have tried superchilling fish by bulk stowage of fish in ice on freezer plates. British engineers recommend a method of superchilling which circulates cold air over boxed fish.

Delegates also said that more automation in fish handling is needed on shipboard as well as when unloading ashore. It was noted that shore auctions of fish may diminish in importance as boxing and freezing at sea increase. It was pointed out that fleet operations are an efficient way to produce quality fish at long distances from port. This may favor certain countries such as Japan, the U.S.S.R., Spain, and Portugal whose fishermen have experience in spending long periods

## United Kingdom (Contd.):

at sea. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, June 23, 1965.)

Note: See Commercial Fisheries Review, April 1965 p. 88.

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FISHING EXHIBITION HELD IN LONDON:

A British trade periodical presented a 1965 World Fishing Exhibition in London, May 27-June 2, 1965. It was sponsored by a number of British fishery associations and open only to members of the fishing industry. Over 200 exhibitors from a dozen countries displayed fishing gear, vessel models and designs, marine engines, deck machinery, electronic navigating and fish-finding devices, and refrigerating and processing equipment.

The industrial exhibits covered practically all phases of the fishing industry. Many exhibits showed new or improved products. There were numerous displays of transistorized electronic devices. Visitors to the exhibition were particularly interested in labor-saving devices such as automated engines and deck machinery; filleting, freezing, and fish-meal processing equipment; and new fish boxes made of aluminum, plastic, and folding woven wire.

A number of exhibits by agencies of the British Government illustrated their work with the fishing industry to provide loans and grants, assist in orderly marketing, conduct exploratory fishing and gear studies, and carry out technological and biological research.

The Soviet Bloc was represented by an East German exhibit of a flake-ice machine and models of fish-reduction and fish-freezing equipment used on freezer trawlers. The East German ice machine was said to have an output of 10 metric tons of flake ice every 24 hours from either fresh or sea water. The East Germans displayed a model of a reduction plant said to have a daily capacity for 35 tons of fish or offal, and requiring only one operator on shipboard or ashore. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, June 23, 1965.)

\* \* \* \* \*

RADIATION-PRESERVATION OF FROZEN FISH UNDER STUDY:

A British program of research into the effects of eating fish preserved by irradiation is being carried out at the Wantage Research Laboratory, with the backing of the White Fish Marketing Board.

The Low Temperature Research Station at Cambridge has already determined the dose of radiation needed to keep fish palatable for 20 or 30 days, or 4 to 5 times ordinary shelf life. It is applied by passing the packaged fish at freezing point through an irradiation unit.

The aim of the present study, which is scheduled to continue through 1966, is to satisfy the British Ministry of Health that there would be no harmful effects if treated fish were used generally. Experimenters report the irradiated fish tastes "far better than anything in the average canteen."

If the study can be completed ahead of schedule, radiation-preserved fish with a low spoilage rate may appear on the British market before the end of 1966. (The Fishing News, London, July 2, 1965.)

\* \* \* \* \*

FISHERY LOAN INTEREST RATES REVISED:

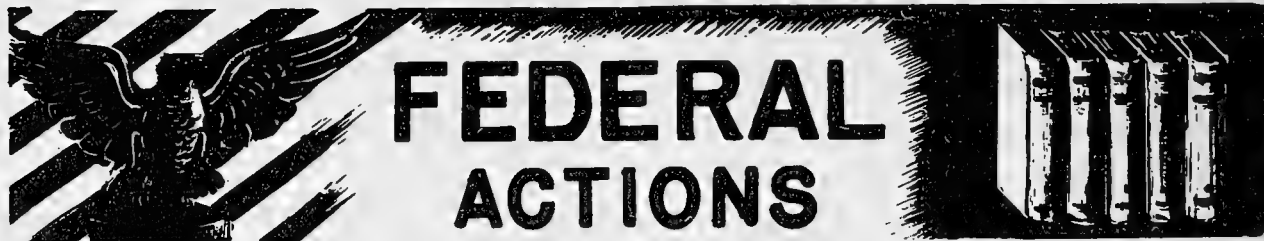
The British White Fish Authority announced that their rates of interest on loans made as from May 8, 1965, would be as follows:

For fishing vessels of not more than 140 feet, new engines, nets and gear: on loans for not more than 5 years,  $7\frac{1}{4}$  percent (decrease  $\frac{1}{8}$  percent); on loans for more than 5 years but not more than 10 years,  $7\frac{1}{4}$  percent (increase  $\frac{1}{8}$  percent); on loans for more than 10 years but not more than 15 years,  $7\frac{1}{4}$  percent (increase  $\frac{1}{4}$  percent); on loans for more than 15 years but not more than 20 years,  $7\frac{1}{4}$  percent (increase  $\frac{1}{4}$  percent).

The rates on advances made before May 8, 1965, are unchanged. (Fish Trades Gazette, London, May 22, 1965.)

Note: See Commercial Fisheries Review, June 1965 p. 80.





## Agency for International Development

### CALIFORNIA FIRM GETS GUARANTEES FROM AID FOR AFRICAN PROJECTS:

Two investment guarantees have been issued by the Agency for International Development (AID) to Star-Kist Foods, Inc., Terminal Island, Calif., which is establishing fish refrigeration plants in Liberia and Senegal.

The guarantees insure the firm against non-convertibility of local currencies and against loss from expropriation, war, revolution, and insurrection.

The refrigeration plants will help in marketing fish products locally, but they are designed primarily for storage prior to shipment.

The plants will meet economic assistance objectives of AID by increasing the availability of protein food, providing steady employment to local labor, and saving scarce foreign exchange.

In Senegal, Star-Kist will hold approximately a 25-percent interest as one of three partners in Frigorifique du Senegal S. A., Dakar. The total amount of AID risk coverage to Star-Kist in Senegal is \$340,500.

The other investment is a joint ownership with two partners in the Liberia Cold Stores, Inc., Monrovia, Liberia. The total amount of coverage under this guaranty is \$350,000. (Agency for International Development, July 20, 1965.)



## Department of the Interior

### BUREAU OF INDIAN AFFAIRS

### PROPOSED REGULATIONS APPLICABLE TO OFF-RESERVATION INDIAN TREATY FISHING:

Notice was published in the Federal Register, July 16, 1965, of a proposal to amend

Title 25, Code of Federal Regulations; by adding a new part 255--Off-Reservation Treaty Fishing. The purpose of the proposed regulations is "to provide a framework within which the exercise of off-reservation fishing rights reserved to certain Indian tribes under treaties with the United States may be subjected to Federal restrictions and controls wherever required for conservation of the fishery resources."

The proposed regulations contain provisions which would provide, among other things, for the issuance of (1) off-reservation treaty fishing permits; and (2) "conservation regulations to govern Indian off-reservation treaty fishing for areas found . . . to be in need of Federal restrictions on Indian fishing as a means of assuring the conservation and wise utilization of the fishery resources for the benefit of the Indians and other persons entitled to the enjoyment thereof."

The proposed regulations provide that off-reservation treaty fishing permits shall be issued only to Indians who are members of a "recognized Indian tribe having off-reservation treaty fishing rights."

Following are the proposed regulations as published in the Federal Register, July 16, 1965:

## DEPARTMENT OF THE INTERIOR

### Bureau of Indian Affairs

### [ 25 CFR Part 255 ]

### OFF-RESERVATION TREATY FISHING

#### Notice of Proposed Rule Making

Notice is hereby given, pursuant to section 4(a) of the Administrative Procedure Act of June 11, 1946 (60 Stat. 237), that the Secretary of the Interior proposes to amend Title 25, Code of Federal Regulations, by adding a new Part 255--Off-Reservation Treaty Fishing. The proposed regulations are set forth in tentative form below.

The proposed regulations are to be adopted under the authority contained



in section 22, Title 5, United States Code, and sections 2 and 9, Title 25, United States Code, and are intended to provide a framework within which the exercise of off-reservation fishing rights reserved to certain Indian tribes under treaties with the United States may be subjected to Federal restrictions and controls wherever required for conservation of the fishery resources.

Prior to the final adoption of the proposed regulations, consideration will be given to any data, views, or suggestions pertaining thereto which are submitted in writing to the Commissioner of Indian Affairs, Department of the Interior, Washington, D.C., 20242, within the period of 30 days from the date of publication of this notice in the **FEDERAL REGISTER**.

The new Part 255 reads as follows:

- Sec.  
255.1 Purpose.  
255.2 Definitions.  
255.3 Off-reservation treaty fishing permits.  
255.4 Unauthorized use of permit cards—only permittees to fish.  
255.5 Possession of permit card.  
255.6 Identification of fishing equipment.  
255.7 Area regulations.  
255.8 Enforcement.  
255.9 Savings provisions.

**AUTHORITY:** The provisions of this Part 255 issued under 25 U.S.C. 2 and 9; 5 U.S.C. 22.

#### § 255.1 Purpose.

(a) The purposes of these regulations are:

- (1) To assist in promoting the development, management, conservation, and protection of the Nation's fisheries resources;
  - (2) To assist in protecting the off-reservation fishing rights which were reserved to certain Indian tribes under their treaties with the United States;
  - (3) To assist in the orderly administration of Indian affairs;
  - (4) To remove uncertainties resulting from recent Federal and State court decisions over the precise fishing restrictions with which Indians with treaty rights must comply;
  - (5) To assist the States in enforcing their laws and regulations for the conservation of fish and wildlife to the extent permitted under any Federal law or treaty applicable to off-reservation fishing activities of Indians; and
  - (6) To facilitate consultation and cooperation between the States and the Indian tribes in the management and improvement of fisheries resources affected by such Federal laws or treaties.
- (b) The following conservation regulations are found to be necessary to assure that the nonexclusive rights reserved to certain Indians by treaty to fish at usual and accustomed places outside the boundaries of an Indian reservation shall be protected and preserved for the benefit of present and future members of such tribes and in a manner consistent with the nonexclusive character of such rights. Any exercise of an Indian off-reservation treaty fishing right shall be in accordance with these regulations, except as may be otherwise authorized by tribal regulation approved by the Secretary of the Interior or his designee or permitted by less restrictive requirements of State law.

#### § 255.2 Definitions.

As used in these regulations:

(a) "Enforcement officer" means (1) any special officer of the Bureau of In-

dian Affairs, U.S. Game Management Agent, U.S. Fishery Management Agent or any other officer or employee of the Department of the Interior or any Indian tribe authorized by the Secretary of the Interior to enforce these regulations, and (2) any officer of any State or political subdivision thereof authorized to enforce State fish or game laws if there is in effect an agreement between the Secretary of the Interior and the fish or game management agency or agencies of such State for the recognition and enforcement of these regulations;

(b) "Off-reservation treaty fishing permit," "permit," or "permit card" mean a permit or card issued pursuant to § 255.3;

(c) "Off-reservation treaty fishing rights" or "treaty right" mean any right reserved or granted to one or more Indian tribes, bands, or groups by treaty with the United States to take, cure, or possess fish at usual and accustomed places outside the boundaries of an Indian Reservation in common with others;

(d) "These regulations" means the regulations comprising this Part 255 of Title 25 of the Code of Federal Regulations together with any regulations adopted pursuant to § 255.7, and any additions thereto or amendments thereof.

#### § 255.3 Off-reservation treaty fishing permits.

(a) Subject to the provisions of these regulations, the Commissioner of Indian Affairs or his designee shall, upon application therefor, issue an Indian off-reservation treaty fishing permit to any Indian whom he finds to be a member of a recognized Indian tribe having off-reservation treaty fishing rights. Such permits shall be issued for periods of not to exceed 5 years and shall be renewed upon application so long as the holder remains entitled to off-reservation fishing rights.

(b) Effective January 1, 1968, no such permit shall be issued to any person who is not on an official membership roll of the tribe which has been approved by the Secretary of the Interior. Prior to that date, the Commissioner of Indian Affairs or his designee may issue such a permit to any person who submits evidence of his entitlement thereto satisfactory to the issuing officer. Any person claiming to have been wrongfully denied a permit may appeal the decision of the issuing officer to the Commissioner of Indian Affairs.

(c) Each permit card shall be evidence that the lawful holder is entitled to the off-reservation treaty fishing rights identified in said permit, to be exercised as provided in these regulations.

(d) No charge or fee of any kind shall be imposed for the issuance of an off-reservation treaty fishing permit, provided that this shall not prevent any Indian tribe from imposing any fee or tax upon the exercise of any tribal fishing right.

(e) No person shall be issued a permit or permits on the basis of membership in more than one tribe at any one time.

(f) All permit cards issued pursuant to these regulations shall be and remain the property of the United States and may be retaken by any enforcement officer from any unauthorized holder (including the permittee during any period for which the permit may have been sus-

pended or revoked pursuant to these regulations). Any card so retaken shall be immediately forwarded to the officer who issued it.

(g) Each permit card issued under these regulations shall specify the period for which it is effective and shall state the name, address, tribal affiliation and enrollment number (if any) of the holder, identify the treaty under which the holder is entitled to fishing rights, contain such additional personal identification data as may be required on fishing licenses issued under the law of the State or States within which it is valid, and be signed by the issuing officer and countersigned by holder.

(h) Upon the revocation or suspension of the off-reservation treaty fishing privileges of the holder of a permit by any court of Indian Offenses or tribal court for violation of any tribal fishing ordinance incorporating or adopting the regulations in this Part 255 and approved by the Secretary of the Interior, any such permit issued hereunder may be revoked or suspended for a like period. No permit shall be issued to any person whose off-reservation treaty fishing privileges may have been suspended or revoked by such court, during the period of such suspension or revocation.

#### § 255.4 Unauthorized use of permit cards—only permittees to fish.

(a) No permit holder shall allow any use of his permit card by any other person. Any use of another's permit card by any Indian subject to these regulations shall constitute a violation of these regulations.

(b) Whenever exercising off-reservation treaty fishing rights no Indian shall allow anyone other than a holder of a currently valid permit under these regulations to fish for him, to use gear marked pursuant to these regulations, or to assist him in fishing.

#### § 255.5 Possession of permit card.

Any Indian fishing under an off-reservation treaty fishing right shall have a currently valid off-reservation treaty fishing permit card in his immediate personal possession while so fishing, or while having in his possession outside an Indian reservation any fish so caught. He shall upon demand display the permit card to any enforcement officer.

#### § 255.6 Identification of fishing equipment.

All fishing gear or other equipment used in the exercise of any off-reservation treaty fishing right and not in the immediate personal possession of such Indian shall be marked in such manner as shall be prescribed in regulations issued pursuant to § 255.7 to disclose the identity of its owner or user.

#### § 255.7 Area regulations.

(a) The Commissioner of Indian Affairs and the Commissioner of Fish and Wildlife shall from time to time jointly recommend to the Secretary of the Interior specific conservation regulations to govern Indian off-reservation treaty fishing for areas found by them to be in need of Federal restrictions on Indian fishing as a means of assuring the conservation and wise utilization of the fishery resources for the benefit of the Indians and other persons entitled to the enjoyment thereof. Such regulations shall be designed to prevent, in conjunc-

tion with appropriate State conservation regulations governing fishing by persons not fishing under treaty rights, the depletion or impairment of the fishery resources.

(b) In formulating their recommendations for regulations to be promulgated by the Secretary of the Interior, the two Commissioners shall seek the views of the affected Indian tribes, of the fishery conservation agency of any affected State, or of other interested persons as may desire to participate in the proposed rule making. A general notice of proposed rule making shall be published in the FEDERAL REGISTER to afford interested persons an opportunity to participate in the rule making through submission of written data, views, or arguments with or without opportunity to present the same orally as may be determined by the Secretary of the Interior. Following the expiration of the time allowed for the submission of written data, views, or arguments, the final recommendations of the Commissioners shall be submitted to the Secretary of the Interior for appropriate action. Such of the recommended regulations or modifications thereof as the Secretary shall adopt shall become effective on such date as the Secretary of the Interior shall prescribe.

(c) Any regulations issued pursuant to this section shall contain provisions for invoking temporary emergency closures or restrictions or the relaxation thereof

at the field level when necessary or appropriate to meet conditions not foreseeable at the time the regulations were issued.

(d) Regulations issued pursuant to this § 255.7 may include such requirements for recording and reporting catch statistics as the Secretary of the Interior deems necessary for effective fishery management.

#### § 255.8 Enforcement.

(a) Any fishing or related activity which is contrary to the provisions of the regulations in this Part 255 and the laws of the State in which it occurs shall be deemed to be outside the scope of any off-reservation treaty fishing rights, and the offender shall be subject to arrest and prosecution under State law: *Provided*, That this paragraph (a) shall not apply to Indians fishing within any Indian reservation or within reservation boundary waters in which an Indian tribe has exclusive fishing rights.

(b) Any unattended fishing gear which is not marked or labeled for identification as required by the regulations in this Part 255 shall be presumed not to be used in the exercise of an off-reservation treaty fishing right and shall be subject to control or seizure under State law.

#### § 255.9 Savings provisions.

Nothing in these regulations (25 CFR Part 255) shall be deemed to:

(a) Prohibit or restrict any persons from engaging in any fishing activity in any manner which is permitted under State law;

(b) Deprive any Indian or any Indian tribe, band or group of any right which may be secured to him or to it by any treaty or other law of the United States;

(c) Permit any Indian to exercise any tribal fishing right in any manner prohibited by any ordinance or regulation of his tribe;

(d) Enlarge the right, privilege, or immunity of any person to engage in any fishing activity granted or reserved by treaty with the United States;

(e) Exempt any person or any fishing gear, equipment, boat, vehicle, fish, or fish products, or other property from the requirements of any law or regulation pertaining to safety, obstruction of navigable waters, national defense, security of public property, pollution, health and sanitation, or registration of boats or vehicles; or

(f) Abrogate or modify the effect of any agreement affecting fishing practices entered into between any Indian tribe and the United States, or any State, or agency of either.

JOHN A. CARVER, Jr.,  
Under Secretary of the Interior.

JULY 5, 1965.



## U.S. Tariff Commission

### STUDY OF FREE ENTRY OF TEMPORARY IMPORTS-- PUBLIC COMMENTS INVITED:

The U. S. Tariff Commission has begun a study of various statutory provisions included in title 19 of the United States Code. Included are those provisions permitting the temporary importation into the United States of merchandise without the payment of ordinary duties, or permitting a virtual recovery of duties paid when the imported merchandise or its domestic equivalent is exported either in its original form or in a changed condition.

Without excluding other sections, the study includes in whole or in part the following sections of title 19 of the U. S. Code: Section 81- Foreign Trade Zones; Section 1202--(Schedule 8, Part 5C) Temporary Free Entry under Bond; Section 1311-Bonded Manufacturing Warehouses; Section 1312-Bonded Smelting and Refining Warehouses; Section 1313-Drawback and Refunds; Section 1555-Bonded Warehouses; Section 1557-Entry for Warehouse--Warehouse Period--Drawback; Section 1562-Manipulation in Warehouse.

The study will review the original objectives of each provision, examine the extent to which each provision is now accomplishing its purposes, and determine the impact each provision has on U. S. international trade. The Commission is especially interested in whether the economic forces which led to the creation of those programs have so changed in the intervening years as to warrant modification and possible consolidation of the procedures to meet current conditions.

Interested parties should file their comments with the Secretary, U. S. Tariff Commission, Washington, D. C., no later than November 1, 1965.

At the conclusion of a preliminary study of all comments and all other pertinent information, the Commission will publish a resume of the results of the preliminary study, together with any proposals for revision of the present statutes. Public notice will be given thereafter of a hearing to be held by the Tariff Commission to permit all interested parties to be present, to produce evidence, and to be heard regarding any proposed revisions. (U. S. Tariff Commission, July 26, 1965.)



## United States District Court

### CERTAIN GULF SHRIMP FISHERMEN HELD TO BE INDEPENDENT CONTRACTORS FOR TAX PURPOSES:

On June 9, 1965, in three separate tax refund cases (Thompson Enterprises, Inc. v. United States; W. G. Wells, et al v. United States; and John Fernandez, et al v. United States), the United States District Court for the Southern District of Florida concluded as a matter of law that shrimp captains and crewmen working on a share basis on plaintiffs' shrimp trawlers were not employees, but independent contractors for Federal employment tax purposes.

Note: See Commercial Fisheries Review, June 1965 p. 83.



## Eighty-Ninth Congress (First Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.



**ANADROMOUS FISH CONSERVATION:** Anadromous Fish--1965: Hearings before the Subcommittee on Fisheries and Wildlife Conservation of the Committee on Merchant Marine and Fisheries, House of Representatives, 89th Congress, 1st session, on Hudson River Spawning Grounds, May 10, 11, 1965, H. R. 23, H. R. 24, H. R. 2634, and H. R. 4349, bills to authorize the Secretary of the Interior to initiate a program for the conservation, development, and enhancement of the Nation's anadromous fish in cooperation with the several states; H. R. 3927, H. R. 800, H. R. 2399, and H. R. 3798, to authorize the Secretary of the Interior to initiate with several states a cooperative program for the conservation, development, and enhancement of the Nation's anadromous fish, and for other purposes; June 2, 3, 1965, Serial No. 89-9, 219 p., printed. Contents include statements, reports, and letters from various state and Federal officials, members of Congress, and representatives from various associations and business firms.

**ANTIDUMPING ACT AMENDMENT:** H. R. 9805 (McMillan) introduced in House July 13, 1965, to amend the Antidumping Act, 1921; to Committee on Ways and Means.

**ANTIDUMPING INTERNATIONAL PROCEDURES:** S. Res. 133 (Javits), introduced in Senate July 28, 1965, expressing the sense of the Senate that the President immediately take such action as may be necessary to convene a conference of the major trading nations, and other interested states, to conclude a multilateral agreement harmonizing the antidumping laws and procedures of all nations; to Committee on Finance.

**ECOLOGICAL RESEARCH AND SURVEY:** S. 2282 (Nelson) introduced in Senate July 13, 1965, to authorize the Secretary of the Interior to conduct a program of research, study, and surveys, documentation and description of the natural environmental systems of the United States for the purpose of understanding and evaluating the condition of these systems and to provide information to those concerned with natural resources management, and for other purposes; to Committee on Interior and Insular Affairs. Includes a section authorizing participation in environmental research in surrounding oceans in cooperation with other countries or with international organizations.

**FACTORY-FISHING VESSELS:** H. R. 10215 (Tupper) introduced in House August 2, 1965, to assist the domestic commercial fishing industry through the construction of three advanced design factory-fishing vessels; to Committee on Merchant Marine and Fisheries.

**FISHERIES LOAN FUND EXTENSION:** H. Rept. 600, Amending Fisheries Loan Act (July 7, 1965, report from Committee on Merchant Marine and Fisheries, U. S. House of Representatives, 89th Congress, 1st session, to accompany S. 998), 12 pp., printed. Committee reported favorably without amendments. Discusses purpose, need, background, conclusion, and cost of the legislation; departmental reports; and changes in existing law.

House July 12, 1965, passed without amendment S. 998, extending and liberalizing terms of fisheries loans which may be made under the Fish and Wildlife Act, and cleared it for the President. Rep. Dingell in Congressional Record (pp. 15778-15783), July 12, 1965, pointed out that S. 998 would extend for 5 years the period during which the Secretary would be authorized to make loans; authorize \$20 million as initial capital; expand the program so as to provide loans for the purchase of new and used vessels; permit loans for vessels other than for those replacing an existing vessel or one lost to the fleet; amend the 1965 act to create a permanent fund.

Senate July 15, 1965, sent to the President S. 998.

On July 24, 1965, the President signed S. 998 (P. L. 89-85).

**FISHERMEN'S COOPERATIVE ASSOCIATIONS BANK:** H. R. 9845 (Brown of Calif.) introduced in House, July 14, 1965, to provide credit facilities for the use of fishermen's cooperative associations through establishment of a Bank for Fishermen's Cooperative Associations, and for other purposes; to Committee on Merchant Marine and Fisheries.

**FISHERMEN'S PROTECTIVE ACT AMENDMENT:** H. R. 9810 (Wilson) introduced in House July 13, 1965, to amend the act of Aug. 27, 1954, relating to the seizure of vessels of the United States by foreign countries; to Committee on Merchant Marine and Fisheries. Rep. Wilson in Congressional Record (pp. 1596-1597), July 13, 1965, pointed out that the bill would amend the Fishermen's Protective Act so that the owner of any detained

American-flag vessel will be reimbursed by the Secretary of the Treasury for all costs, including demurrage.

**FISHERMEN'S ORGANIZATION AND COLLECTIVE BARGAINING:** Subcommittee on Merchant Marine and Fisheries of Senate Committee on Commerce met Aug. 5, 1965, on S. 1054, assuring bargaining rights of fishermen's organizations in the ex-vessel sale of fish on which the livelihood of their members depend.

**FISHING LIMIT OF 12 MILES:** Sen. Bartlett in Congressional Record (p. 15384), July 8, 1965, pointed out that in Japan his Bill (S. 2218) has been criticized as being contrary to international law and to international custom. The facts do not support such statements. There is no international law establishing proper breadths for territorial seas.

Sen. Gruening in Congressional Record (pp. 16077-16079), July 13, 1965, spoke in the Senate regarding "Action To Establish the 12-Mile Limit for Our Fisheries Gains Support: It is Overdue." He inserted "Proclamation 2668--Policy of the United States with Respect to Coastal Fisheries in Certain Areas of the High Seas, By The President of the United States of America," "Executive Order 9633--Reserving and Placing Certain Resources of the Continental Shelf Under the Control and Jurisdiction of the Secretary of the Interior"; and Executive Order 9634; all issued by President Truman. Same day Rep. Wilson (Calif.) in extension of remarks inserted (p. A3715) an editorial from San Diego Union of July 1, 1965, "Twelve-Mile Coastal Limit is Excellent Beginning."

**FOOD MARKETING NATIONAL COMMISSION:** House, August 2, 1965, received a letter from the Chairman, National Commission on Food Marketing, transmitting interim report of the National Commission on Food Marketing, July 1, 1965, pursuant to Public Law 88-354; to Committee on Agriculture.

**HALIBUT COMMISSION:** S. Rept. 383, Offices For The International Pacific Halibut Commission (June 30, 1964, report from the Committee on Commerce, U. S. Senate, 89th Congress, 1st session, to accompany S. 1975), 8 pp., printed. Committee reported favorably with amendment. Discusses purpose, background, and need for legislation; cost; changes in existing law; Federal agency comments; and text of North Pacific Halibut Act of 1937, as amended.

House July 8, 1965, received Senate-passed S. 1975, an act to amend the Northern Pacific Halibut Act in order to provide certain facilities for the International Pacific Halibut Commission; to Committee on Merchant Marine and Fisheries. Also, July 9, H. R. 9734 (Pelly); July 13, H. R. 9801 (Adams); July 29, H. R. 10174 (Meeds); to Committee on Merchant Marine and Fisheries; all similar to S. 1975. Purpose is to authorize \$500,000 to construct facilities needed by the Commission. Rep. Meeds pointed out in Congressional Record (p. 18078) July 29, the necessity for the facilities and remarked on the Commission's work in conserving the North Pacific halibut resources.

**HEALTH, EDUCATION, AND WELFARE APPROPRIATIONS, FY 1966:** Subcommittee, in executive session, July 27, 1965, approved for consideration of full Senate Committee on Appropriations H. R. 7765, fiscal 1966 appropriations for the Departments of Labor and Health, Education, and Welfare, and related agencies. Includes funds for botulism research under the Food and Drug Administration; water pollution control under

Office of the Secretary; pesticide activities, water supply and water pollution control, shellfish sanitation program, and botulism under the Public Health Service.

**MARINE AND ATMOSPHERIC AFFAIRS COORDINATION ACT OF 1965:** S. 2251 (Muskie and 17 others) introduced in Senate July 7, 1965, to coordinate the major civilian marine and atmospheric functions of the Federal Government through the establishment of a Department of Marine and Atmospheric Affairs, to enunciate national policies pertinent to the marine and atmospheric interests of the United States, to further the expanded exploration of marine environs and the use of marine resources, to encourage research and development in the marine and atmospheric sciences and technologies, and for other purposes; to Committee on Government Operations. Would among other things, establish a Department of Marine and Atmospheric Affairs, which would include "the U. S. Maritime Administration, U. S. Coast Guard, U. S. Coast and Geodetic Survey, U. S. Weather Bureau, the National Oceanographic Data Center, the coastal Engineering Research Center, the Sea-Air Interaction Laboratory, the Central Radio Propagation Laboratory--all existing agencies--and a new Bureau of Marine Fisheries formed by the division of the fisheries responsibilities of the present Fish and Wildlife Service. A new coordinating office of Marine Geology and Mineral Resources would also be established. Also introduced in House July 27, H. R. 10106 (Hathaway); July 28, H. R. 10136 (Rivers of Alaska) and H. R. 10138 (Thompson of Texas); Aug. 3, H. R. 10231 (O'Neill of Mass.)

**MARINE BIOLOGICAL LABORATORY:** Senate Committee on Commerce July 19, 1965, submitted report (S. Rept. 463) on S. 1735 (without amendment).

S. Rept. 463, Land Use by U. S. Marine Biological Research Laboratory, La Jolla, Calif. (July 19, 1965, report from the Committee on Commerce, U. S. Senate, 89th Congress, 1st session, to accompany S. 1735), 5 pp., printed. Presents purpose of bill, agency reports, and cost.

Senate July 21, 1965, passed without amendment S. 1735, limiting use of certain University of California lands donated for a marine biological research laboratory. Sen. Mansfield pointed out in Congressional Record (pp. 17066-17067), July 21, 1965, that the purpose of the bill is to authorize and direct the Secretary of the Interior to reconvey certain lands to the University of California when those lands are no longer needed by the United States or when the United States ceases to use the land for more than 2 years exclusively for fishery and oceanography research purposes.

House July 22, 1965, received Senate-passed S. 1735; to Committee on Merchant Marine and Fisheries.

**METRIC SYSTEM STUDY:** Senate Committee on Commerce July 14, 1965, held hearings on S. 774, providing for a study to determine the practicability of adoption by the U. S. of the metric system of weights and measures. Hearings adjourned subject to call.

House Committee on Science and Astronautics held a hearing Aug. 3, 1965, on H. R. 2626, similar to S. 774.

**MINIMUM WAGE:** Subcommittee on Labor of Senate Committee on Labor and Public Welfare concluded its current series of hearings on S. 1986, to extend minimum wage coverage under the Fair Labor Standards Act, and other pending related bills (S. 763, 1741, 1770, and 2210).

Rep. Krebs inserted in Congressional Record (pp. A3947-3948) July 21, 1965, under extension of remarks, a discussion on "Minimum Wage Should be \$2 an Hour."

H. R. 10275 (Roosevelt) introduced in House Aug. 4, 1965, to amend the Fair Labor Standards Act of 1938 to extend its protection to additional employees, to raise the minimum wage, and for other purposes; to Committee on Education and Labor.

**OCEANOGRAPHY:** Subcommittee on Oceanography of House Committee on Merchant Marine and Fisheries held hearings August 3-12 on H. R. 921, 2218, 5654, 6457, 5175, 5884, 7849, and 9064, similar bills dealing with various approaches to oceanography in government.

**OCEANOGRAPHIC AGENCY OR COUNCIL:** Senate Committee on Commerce, July 15, 1965, in executive session, ordered favorably reported amended S. 944. Committee held another executive session on July 20, and on July 29, 1965, reported (S. Rept. 528) with amendments to Senate S. 944, to provide for expanded research in the oceans and the Great Lakes, to establish a National Oceanographic Council, and for other purposes. Senator Pell pointed out in Congressional Record (p. 18146), July 29, 1965, that as amended bill provides for a "National Council on Marine Resources and Engineering Development" staff at the Cabinet level, and that it will not disrupt the existing oceanographic agencies, but will provide them with coordination and high-level endorsement they require. At the same time, it calls for a self-liquidating Commission on Marine Science, Engineering, and Resources, to plan a broad outline, over an 18-month period, or proposed policy and direction.

Subcommittee on Oceanography of House Committee on Merchant Marine and Fisheries Aug. 3, 1965, held hearings on H. R. 921, and similar bills, dealing with variation of approach to the establishment of a comprehensive long-range and coordinated national program in oceanography; also held hearing on H. R. 5175, oceanography legal problems.

Sen. Murphy in Congressional Record (p. 18383), Aug. 3, 1965, spoke in the Senate, paying tribute to San Diego for its world leadership in the exploration and study of our oceans. One of the most significant contributions to date has been the launching of "Sealab II," the U. S. Navy's man-in-the-sea-program. He continued: When the "Sealab II" underseas unit starts its experimental work later this month in actual underseas quarters on the ocean bottom one-half mile off the Institution of Oceanography at La Jolla, the Nation will see and hear regular televised broadcasts from "Sealab II" and the 210-foot deep quarters. Aquanauts in the quarters will carry out experimental salvage techniques, engage in oceanographic and marine biological research, and undergo a series of physiological and human performance tests. Also referred to legislation he introduced to provide expanded research and establish National Oceanographic Council; to S. 944 to coordinate Nation's overall efforts to explore the oceans and set up an Oceanographic Council; and Rep. Wilson's proposal to establish a National Oceanographic Year.

**"OCEANOGRAPHIC" INVESTIGATIONS:** Rep. Wilson in Congressional Record (pp. A4010-4011), July 22, 1965, in extension of remarks included the following article from the July 9, 1965, Free Cuba News: "Inside Cuba: Russia Extends 'Oceanographic' Investigations."

**OCEANOGRAPHY LEGAL PROBLEMS:** Subcommittee on Oceanography of House Committee on Merchant

Marine and Fisheries Aug. 3, 1965, held hearings on H. R. 5175, providing for a study of the legal problems of management, use, and control of the natural resources of the oceans and ocean beds. Also held hearing on H. R. 921, oceanographic agency or council.

**OCEANOGRAPHIC RESEARCH VESSEL INSPECTION:** H. Rept. 599, Exempting Oceanographic Research Vessels From the Application of Certain Vessel Inspection Laws (July 7, 1965, report from the Committee on Merchant Marine and Fisheries, U. S. House of Representatives, 89th Congress, 1st session, to accompany S. 627), 9 pp., printed. Committee reported favorably with amendments. Discusses purpose, background, amendments, and cost of the legislation; and Federal agency comments.

House July 12, 1965, passed and returned to Senate, with committee amendments, S. 627, to exempt oceanographic research vessels from the application of certain vessel inspection laws.

Senate July 19, 1965, concurred in House amendments to S. 627; this cleared bill for President's signature.

S. 627, to exempt oceanographic research vessels from the application of certain vessel inspection laws, was signed by the President July 30, 1965, P. L. 89-99.

**PASSAMAQUODDY TIDAL POWER PROJECT:** Senate July 12, 1965, received a communication from the President of the United States, transmitting, for the information of the Senate, reports on the Passamaquoddy tidal power project and the Upper St. John River hydroelectric development (with accompanying document); to Committee on Public Works. On same day House received the same communication (H. Doc. 236); to Committee on Public Works.

H. R. 9765 (Hathaway, Maine) and H. R. 9775 (Tupper, Maine) introduced in House July 12, to authorize a flood control project on the upper St. John River, and for other purposes; to Committee on Public Works. Rep. Hathaway inserted letters he wrote to the President and the Secretary of the Interior; also a letter from Secretary Udall to the President which spells out the proposals of the Secretary and which was approved by the President. Among the recommendations in Secretary's letter was one in which the Federal Government, in full participation with State and regional planning groups, would continue to intensify a comprehensive program already planned and initiated for the multiple use of the area's natural resources including, among others, fish and wildlife conservation, particularly by restoration of the Atlantic salmon fisheries.

**TECHNOLOGICAL LABORATORY LAND IN MARYLAND:** The Public Lands Subcommittee of Senate Committee on Interior and Insular Affairs July 9, 1965, in executive session, approved for full committee consideration S. 1988. Property affected includes the site of the Bureau of Commercial Fisheries Technological Laboratory, College Park, Md.

Senate Committee on Interior and Insular Affairs July 19, 1965, favorably reported and submitted report (S. Rept. 468) on S. 1988.

Senate July 21, 1965, passed with committee amendment S. 1988. Sen. Mansfield pointed out in Congressional Record (pp. 17068-17069), July 21, 1965, that the bill would authorize the Secretary of the Interior to convey to the State of Maryland approximately 14 acres of



land on the University of Maryland campus at College Park, Md., which was donated by the State of Maryland to the United States in 1935, and now occupied by the Bureau of Mines and the Fish and Wildlife Service.

House July 22, 1965, received Senate-passed S. 1988.

**TERRITORIAL SEA AND CONTIGUOUS ZONE CONVENTION:** H. R. 10177 (Rivers of Alaska) and H. R. 10183 (Pelly), introduced in House July 29, 1965, to establish a contiguous fishery zone beyond the territorial sea of the United States; to the Committee on Merchant Marine and Fisheries. Similar to other Senate and House bills.

**TRADE EXPANSION ACT AMENDMENT:** H. R. 9696 (Berry) introduced in House July 8, 1965, to amend the Trade Expansion Act of 1962; to Committee on Ways and Means. Rep. Berry in Congressional Record (pp. 15485-15486), July 8, 1965, pointed out that the legislation which he was joining in introducing would go far to moderate the extreme measures that could be taken under the present law. First, the hope of gaining adjustment assistance would be considerably enhanced by loosening the requirements of the law. Second, criteria are laid down by which items can be removed from the President's list of products offered for tariff cuts. The present bill would go beyond that by providing for import quotas if certain import levels are reached. Also, H. R. 9920 (Fisher) July 19; H. R. 10058 (Dent), July 26; to Committee on Ways and Means.

Rep. Moore in Congressional Record (pp. 15733-15735), July 9, 1965, stated that he was joining those who have introduced a bill to amend the Trade Expansion Act of 1962 so as to "remove certain items from the President's list and provide machinery for the imposition of import quotas to prevent imports from doing yet more damage than they have already inflicted on many of our industries."

Rep. Fisher in extension of remarks in Congressional Record (p. A3873-A3875), July 19, 1965, pointed out the urgent need for amending the Trade Expansion Act of 1962. Bill would establish criteria to guide our negotiators in Geneva, would make it possible to prevent further tariff reductions in all instances in which imports have reached a height equal to at least  $7\frac{1}{2}$  percent of domestic production, provided that the imports had increased at least 75 percent since 1958, which was the year in which the last preceding tariff-cutting act was passed.

H. R. 10135 (Fogarty), introduced in House July 28, 1965, to amend the Trade Expansion Act of 1962; to the Committee on Ways and Means. Would in effect establish a new style of peril point by providing that no product that is imported to the extent of at least  $7\frac{1}{2}$  percent of domestic production and has increased as much as 75 percent since 1958 would be subjected to another tariff cut under the present negotiations; or if imports already supply as much as 20 percent of the domestic market, while the number of production workers in the domestic industry has declined since 1958, no further tariff cut would be permitted. There are a few other criteria that, if met by imports of a particular product, would remove that item from the President's authorization to cut the tariff.

Rep. Langen pointed out in Congressional Record (pp. 18067-18068), July 29, 1965, under the title, "U.S. Economy Needs Improved Trade Policy," that he joined

others who have introduced legislation to amend the Trade Expansion Act, and gave his reasons. H. R. 10168 (Utt) introduced in House July 29, to amend the Trade Expansion Act of 1962; to Committee on Ways and Means.

H. R. 10237 (Mrs. Reid of Ill.) and H. R. 10285 (Hall) introduced in House Aug. 3, and Aug. 4, 1965, respectively, to amend the Trade Expansion Act of 1962; to Committee on Ways and Means. Rep. Collier in Congressional Record (p. 18569), Aug. 3, 1965, pointed out that a bill should be passed that provides that any product whose imports have risen 75 percent since 1958 and now occupies  $7\frac{1}{2}$  percent of domestic production, should be taken off the list of products to be considered for further tariff reductions.

**VESSEL "JANICE VEE,"** Subcommittee on Coast Guard, Coast and Geodetic Survey, and Navigation of House Committee on Merchant Marine and Fisheries July 14, 1965, held hearing on H. R. 2137, to permit the vessel Janice Vee to be documented for use in the fisheries and coastwise trade.

**WATER POLLUTION CONTROL ADMINISTRATION:** Senate July 28, 1965, insisted on its amendments to S. 4, Water Quality Act of 1965, asked for conference with House, and appointed conferees.

House July 29, 1965, insisted on its amendment to S. 4; agreed to a conference asked by the Senate, and appointed conferees. Would amend the Federal Water Pollution Control Act as amended, to establish the Federal Water Pollution Control Administration, to provide grants for research and development, etc.

Conferees, Aug. 4, 1965, met to resolve the differences between the Senate- and House-passed versions of S. 4; recessed subject to call.

**WATER PROJECT RECREATION ACT:** Senate July 12, 1965, received message from the President announcing that on July 9, 1965, the President approved and signed S. 1229, to provide uniform policies with respect to recreation and fish and wildlife benefits and costs of Federal multiple-purpose water resource projects, and for other purposes (P. L. 89-72).

**WATER RESOURCES PLANNING ACT:** Committee of Conference July 8, 1965, filed conference report (H. Rept. 603) in House on S. 21, to provide for the optimum development of the Nation's natural resources through the coordinated planning of water-related land resources, establishment of a water resources council and river basin commission.

H. Rept. 603, Development of the Nation's Natural Resources (July 8, 1965, report from the Committee of Conference, U. S. House of Representatives, 89th Congress, 1st session, to accompany S. 21), 13 pp., printed. Committee recommended that Senate Recede from its disagreement to the amendment of the House and agree to the same with an amendment. Discusses statement of policy and effect on existing laws; presents text of bill, and statement of managers on the part of the House.

By a voice vote House July 13, 1965, adopted the conference report on S. 21, and sent the bill to the Senate.

Senate July 14, 1965, received and agreed to report of the Committee of Conference on S. 21. Thus bill was cleared for President's signature.

President on July 22, 1965, signed S. 21 (P. L. 89-80).





## FISH AND WILDLIFE SERVICE PUBLICATIONS

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SEP.- SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.  
SL - STATISTICAL LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.  
SSR.- FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

Number	Title
CFS-3756	- Fish Meal and Oil, January 1965; 2 pp.
CFS-3791	- Maine Landings, 1964 Annual Summary, 16 pp.
CFS-3795	- Florida Landings, 1964 Annual Summary, 12 pp.
CFS-3798	- North Carolina Landings, March 1965, 4 pp.
CFS-3802	- Maine Landings, February 1965, 4 pp.
CFS-3804	- Georgia Landings, 1964 Annual Summary, 9 pp.
CFS-3805	- Fish Meal and Oil, February 1965, 2 pp.
CFS-3807	- Rhode Island Landings, January 1965, 3 pp.
CFS-3811	- Fish Meal and Oil, March 1965, 2 pp.
CFS-3812	- Texas Landings, January 1965, 2 pp.
CFS-3813	- Maryland Landings, 1964 Annual Summary, 11 pp.
CFS-3814	- Texas Landings, February 1965, 2 pp.
CFS-3815	- New York Landings, March 1965, 4 pp.
CFS-3817	- North Carolina Landings, April 1965, 4 pp.
CFS-3819	- South Carolina Landings, 1964 Annual Summary, 6 pp.
CFS-3820	- Fish Meal and Oil, April 1965, 2 pp.
CFS-3822	- Florida Landings, April 1965, 8 pp.
CFS-3823	- Maine Landings, March 1965, 4 pp.
CFS-3825	- Virginia Landings, February 1965, 4 pp.
CFS-3827	- California Landings, March 1965, 4 pp.

SL-1 - Wholesale Dealers in Fishery Products, Maine, 1964 (Revised), 7 pp.

### Firms Canning Fishery Products, 1963 (Revised):

SL-101 - Salmon, 4 pp.  
SL-102 - Maine Sardines, 1 p.  
SL-102A - Pacific Sardines, 1 p.  
SL-103 - Tuna, 2 pp.  
SL-103A - Tunalike Fishes, 1 p.  
SL-104 - Mackerel, 1 p.  
SL-105 - Alewives, 1 p.  
SL-106 - Shad, 1 p.  
SL-107 - Fish and Shellfish Specialties, 6 pp.

SL-109 - Caviar and Fish Roe, 3 pp.  
SL-110 - Oysters, 2 pp.  
SL-111 - Clam Products, 4 pp.  
SL-112 - Shrimp, 2 pp.  
SL-113 - Crab Meat, 2 pp.  
SL-116 - Food for Animals, from Marine-Animal Products, 4 pp.  
SL-118 - Groundfish Flakes, 1 p.  
SL-119 - Squid, 1 p.  
SL-120 - Anchovies, 1 p.

### Firms Manufacturing Fishery Industrial Products, 1963 (Revised):

SL-152 - Oyster Shell Products, 2 pp.  
SL-153 - Miscellaneous Industrial Fishery Products, 2 pp.  
SL-154 - Seaweed Products, 1 p.  
SL-155 - Marine Pearl Shell Buttons, 1 p.  
SL-156 - Pearl Essence, 1 p.  
SL-159 - Fresh-Water Mussel-Shell Products, 1 p.  
SL-160 - Menhaden Products, 2 pp.

Sep. No. 738 - Herring Fishery in Southeastern Alaska.

Sep. No. 739 - The Yellowfin Tuna Fishery in the Eastern Tropical Atlantic (Preliminary Study).

Sep. No. 740 - Equipment Note No. 17 - Long-Line Gear Improvement - Aluminum Crimping Sleeve Prevents Hook Damage by Electrolysis.

FL-572 - Author Index of Publications, Addresses, Translations, News Releases, Letters to Editors, and Letters to Industry - 1963; Bureau of Commercial Fisheries Branches of Economics, Technology, and the Branch of Reports at Seattle, by F. Bruce Sanford, Kathryn L. Osterhaug and Helen E. Platino, 16 pp., May 1965.

SSR-Fish. No. 504 - Studies of the Early Life History of Atlantic Menhaden in Estuarine Nurseries. Part I-- Seasonal Occurrence of Juvenile Menhaden and Other Small Fishes in a Tributary Creek of Indian River, Delaware, 1957-58, by Anthony L. Pacheco and George C. Grant, 32 pp., April 1965.

SSR-Fish. No. 499 - A Study of Ocean Fronts off Cape San Lucas, Lower California, by Raymond C. Griffiths, 60 pp., illus., Feb. 1965.

SSR-Fish. No. 507 - A Preliminary Bibliography with KWIC Index on the Ecology of Estuaries and Coastal Areas of the Eastern United States, by Robert Livingstone, Jr., 354 pp., May 1965.

SSR-Fish, No. 515 - Annual Fish Passage Report - Rock Island Dam, Columbia River, Washington, 1964, by Paul D. Zimmer and John H. Broughton, 25 pp., illus., April 1965.

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE REPORT IS AVAILABLE FROM THE U. S. BUREAU OF COMMERCIAL FISHERIES, 101 SEASIDE AVE., TERMINAL ISLAND, CALIF. 90731.

Views on Revision of the Japan-Soviet Fisheries Treaty, by Kisaburo Taguchi, Translation Series No. 16, 7 pp., processed, June 1965. (Translated from the Japanese, Rakusui Separate No. 636, Aug. 1964, 4 pp.)

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS NOT FOR GENERAL DISTRIBUTION BUT IS AVAILABLE FOR REFERENCE ONLY FROM THE BIOLOGICAL LABORATORY, BUREAU OF COMMERCIAL FISHERIES, U. S. FISH AND WILDLIFE SERVICE, P. O. BOX 3830, HONOLULU, HAWAII, 96812.

Some Thoughts on Oceanographic Conditions and Fishing Conditions in Palau Waters, 5 pp., processed, 1964. (Translated from the Japanese, Nanyo Suisan Joho--South Sea Fishery News--vol. 3, no. 1, 1939.)

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BUREAU OF COMMERCIAL FISHERIES, RM. 510, 1815 N. FORT MYER DR., ARLINGTON, VA. 22209.

Number	Title
MNL- 9	- Fishery Developments in the Philippines, 1964, 4 pp.
MNL- 12	- Major Developments in Peru's Fishing Industry, 1964, 8 pp.
MNL- 26	- Taiwan Fisheries in 1964, 21 pp.
MNL- 82	- Fisheries of Ecuador, 1964, 8 pp.
MNL- 97(Supplement)	- Thailand's Fisheries, 20 pp.
MNL-100	- World Fishing Exhibition, London, May 27-June 1, 1965, 4 pp.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, May 1965, 15 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif. 90731.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish and prices for fish meal, oil, and solubles; for the month indicated.

California Fishery Market News Monthly Summary, Part II - Fishing Information, May 1965, 13 pp., illus. (U. S. Bureau of Commercial Fisheries, Tuna Resources Laboratory, P. O. Box 271, La Jolla, Calif. 92038.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the month indicated. Included is an article, "Temperate tuna forecast for 1965," prepared by the Tuna Forecasting Program.

(Chicago) Monthly Summary of Chicago's Wholesale Market Fresh and Frozen Fishery Products Receipts, Prices, and Trends, April 1965, 15 pp., (Market News Service, U. S. Fish and Wildlife Service, U. S. Customs House, 610 S. Canal St., Rm. 704, Chicago, Ill. 60607.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and weekly wholesale prices for fresh and frozen fishery products; for the month indicated.

Fishery and Oceanography Translations, no. 5, April 1965, 38 pp., processed. (Translation Program, Branch of Reports, Bureau of Commercial Fisheries, 2725 Montlake Blvd. E., Seattle, Wash. 98102.) Contains a list, "Translations of fishery and oceanographic literature, authors Ke-L," compiled by Paul T. Macy, and consisting of citations of literature in many languages.

Gulf Fisheries (Selected Areas) - 1964, by E. J. Barry, 40 pp., illus., June 1965. (Market News Service, U. S. Fish and Wildlife Service, 600 South St., New Orleans, La. 70130.) Summarizes the commercial landings of fish and shellfish for selected areas of the Gulf States of Florida (West Coast), Alabama, Mississippi, Louisiana, and Texas. The tables show landings for only the specific areas designated and cannot be interpreted as representing the total landings for a given state. However, the data do give an indication of general trends. Part I reports on developments and conditions in Gulf Coast fisheries during 1963 and gives a resume of the individual fisheries. Discusses the shrimp fishery in detail; production and market conditions for the oyster, blue crab, and finfish fisheries; as well as imports of fresh and frozen fish and shellfish. Part II includes statistical tables showing total fishery products landings; crab meat production by areas and months; and menhaden landings, and production of fish meal, oil, and solubles. It also gives data on fishery imports through Morgan City and the New Orleans, La., Customs District, Port Isabel-Brownsville and Houston, Tex., and Mobile, Ala.; and LCL express shipments from New Orleans for 1964 by months and destination. Also included are tables showing monthly range of wholesale prices of fishery products on the New Orleans French Market; Gulf States oyster and shrimp packs, 1963/64 season and packs by season 1959/64; and fishery products market classifications in the Gulf Area.

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, May 1965, 13 pp., (Market News Service, U. S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans, La. 70130.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; Gulf menhaden landings and production of meal, oil, and solubles; fishery imports at Mobile, Ala., Morgan City and New Orleans, La., Miami, Fla., and Houston, Port Isabel, and Brownsville, Tex.; and sponge sales; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, May 1965, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va. 23369.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New York City's Wholesale Fishery Trade, 1964 (Includes Statistics and Marketing Trends), 44 pp., illus., (Market News Service, U. S. Bureau of Commercial Fisheries, 155 John St., New York, N. Y. 10038.) The first part of this annual summary discusses fish-

ery products receipts, prices, and imports; fish meal, oil, and solubles prices; highlights of the 1964 season; shrimp supplies, prices, and imports; and canned tuna prices in the salt-water section of New York's wholesale Fulton Fish Market. The second section covers receipts, prices, and trends in the fresh-water fish market (Peck Slip Area). The final section contains statistical tables giving receipts of fresh and frozen fish and shellfish by species, states and provinces, and transport methods, 1963-64; landings and ex-vessel prices at Fulton Market; imports through New York Customs District; frozen fishery products prices by months; and monthly shrimp imports by country.

Southeastern Alaska Sea Surface Temperatures, 1959-63, by Richard S. Williamson, Data Report 8, 2 microfiche cards, illus., April 1965, distribution limited. (Branch of Reports, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington, D. C. 20240.)

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, May 1965, 9 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl vessels reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

THE FOLLOWING SERVICE PUBLICATION IS FOR SALE AND IS AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. 20402.

Fish and Shellfish Over the Coals, Test Kitchen Series No. 14, 24 pp., illus., printed, 1965, 40 cents. Developed especially for those who enjoy cooking outdoors, this new booklet gives recipes for lobster tails, whitefish in foil, flounder with crab stuffing, rainbow trout, charcoal-broiled scallops, and many other tasty fishery delicacies. Home economists of the Bureau test-proved nearly 40 new recipes and serving ideas which are illustrated in color in the booklet. It also has helpful suggestions for buying fish for quality and quantity, and tips on starting and maintaining the charcoal fire. This new publication is part of the continuing consumer education program being conducted in cooperation with the fishery industries of the United States. It should help many more consumers realize the economy and nutritive value of fish as an every day food.

## MISCELLANEOUS PUBLICATIONS

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### ABALONE:

"Abalone research in South Africa," by G. G. Newman, article, The South African Shipping News and Fish-

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### AFRICA:

Fishery along Northwestern Africa, by K. Kukhorenko and Yu. Chuksin, 54 pp., printed in Russian, 1962. Knizhnoe Izdatel'stvo, Kaliningrad, U.S.S.R.

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"The significance of the diver's work when studying the distribution and amount of algae in the seas of the U.S.S.R.," by M. S. Kireyeva, TI-64-19773, 5 pp., printed, 1964, \$1. (Translated from the Russian, Trudy Okeanograficheskoy Komissii, vol. 14, 1962, pp. 69-73.) Clearinghouse for Federal Scientific and Technical Information, U. S. Department of Commerce, Port Royal and Braddock Rds., Springfield, Va. 22151.

"Sobre a composicao quimica de algumas especies de algas marinhas brasileiras" (On the chemical composition of some Brazilian species of marine algae), by Mario Queiroz Mandelli, article, Ciencia e Cultura, vol. 16, no. 3, 1964, pp. 281-284, illus., printed in Portuguese with English summary. Instituto "Nami Jaset" o Progresso para la Ciencia e Cultura, 667 Rua Senador Queiroz, Sao Paulo, Brazil.

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The Air Almanac, 1965, September-December, Catalog No. D 213.7:965/3, 328 pp., illus., processed, June 1965, \$3.25. Naval Observatory, U. S. Department of the Navy, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) This issue of the almanac provides, in convenient form, the astronomical data required for air navigation during the period Sept. 1, 1965 to Jan. 1, 1966.

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A Guide to the Properties, Characteristics and Uses of Some General Anaesthetics for Fish, by Gordon R. Bell, Bulletin No. 148, 13 pp., printed, 1964, 50 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada. Agents, described as general anaesthetics, which reversibly depress the sensory centers of the brain to various degrees and which finally eliminate reflex action, are being used more and more widely in fisheries biology. The author has prepared a chart which assembles the essential data on anaesthetics for fish to act as a guide for selection of the most appropriate anaesthetic for laboratory or field work. Eleven chemical anaesthetics are detailed. Information on each includes: manufacturer, expense, molecular weight, solubility, stability, toxicity to man, dosage required, immobilization and "righting" time periods, peculiar effects, suggested uses, and particular reaction involved. Topical and general bibliographies are included.

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"The protection of marine products from their deterioration due to the oxidation of oil. X--Application of antioxidant preparation containing surface active agents. Part 2--The moment dipping method for protecting salted fishes," by Kenzo Toyama and Kuman Saruya, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 29, July 1963, pp. 675-681, printed. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

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Instructional-educational picture-stories of numerous aspects of human knowledge are available as color slide sets and film strips. Each set of slides is packaged in a durable cardboard container, labeled for ease of identification. Each slide is identified by title and code number, making it easy to select and project specific slides correlated to the day's lesson. Each filmstrip, using color photographs, is topically designed for use in whole or in part. Text frames itemize concepts, vocabulary frames point out new words, simplified diagrams and discussion questions help clarify ideas. Several are on the sea, lakes, and streams. Society of Visual Education, Inc., 1345 Diversey Parkway, Chicago, Ill. 60614:

*Algae and Fungi*, S53S, Natural Science series, for Jr.-Sr. High Schools, set of 10 slides, \$4.50.

*Introduction to Algae*, 448-2, The Microscope and Its Use series, for Jr.-Sr. High Schools, 35 captioned frames, \$5. How a specimen is prepared for investigation and how the nucleus of the algae cell is made visible under the microscope.

*Let's Explore a Pond*, 423-4, Exploring the World of Nature series, for Intermediate-Jr. High Schools, 50 captioned frames, \$6. Shows how ponds are formed, how they may fill to form marshes and swamps. Illustrates plant and animal life and their growth and activity in summer and winter.

*Let's Explore a Stream*, 423-5, Exploring the World of Nature series, for Intermediate-Jr. High Schools, 50 captioned frames, \$6. Illustrates plants and animals in various habitats formed by pools, riffles, and waterfalls; how moving water works for man; and how thoughtless pollution of streams destroys plant and animal life.

*Songs of the Sea*, 681-1R, Our American Heritage of Folk Music Series, for Intermediate-Jr.-Sr. High Schools, 46 frames with 33 $\frac{1}{2}$  r. p. m. record (coupled with *Songs of the Cowboy*), both filmstrips with record \$15. How singing eased the labor and loneliness of seafaring men in the days of sail--"Haul Away, Joe"; "Blow the Man Down"; "Rio Grande"; and "Shenandoah."

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- "Fish flour supplementing effect on low-protein and high-protein maize diets of India," by V. Chalam Metta and Saroja Metta, article, Indian Journal of Medical Research, vol. 52, no. 4, 1964, pp. 392-397, printed. Job Press Private Ltd., P. O. Box 124, Cawnpore, India.
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- Sobre el Valor Biologico y Otros Indices Nutritivos de las Proteinas de SARDINA PILCHARDUS, TRACHURUS TRACHURUS, BRAMA RAI y MERLUCCius MERLUCCius (On the Biological Value and Other Nutritive Indices of the Proteins of Sardina pilchardus, Trachurus trachurus, Brama rai and Merluccius merluccius), by J. Larralde, J. Bello and C. Rodriguez, pp. 307-321, illus. Results of studies of digestibility of four types of fish flour or fish protein concentrate.
- Articles from International Association of Fish Meal Manufacturers News Summary, no. 16, Jan. 1965, processed. International Association of Fish Meal Manufacturers, 70 Wigmore St., London W1, England.
- "War on malnutrition," pp. 6-18, illus. (Reprinted from Pesca, Sept. 1964, pp. 14-21.) Reports on the value of fish flour as a major, inexpensive protein supplier. Discusses the challenge to fish industrialists to investigate and develop fish protein concentrate as a primary weapon in the war against malnutrition, particularly in underdeveloped nations.

"Fish flour in Peru," by Steve Harrison, pp. 18-21, (Reprinted from Andean Air Mail and Peruvian Times, Nov. 13 1964.) A report on the verification, especially in Peru, of fish flour as an edible commodity. The news item is designed to throw light on a subject with which, in spite of its vital importance, the general public is inadequately informed.

"Edible fish flour (F. P. C.) now produced by pilot plants of two companies in Peru," pp. 22-24, processed in English with resumes in French, German and Spanish. (Reprinted from Peruvian Times, Nov. 27, 1964.) Discusses fish flour as a possible answer to Peru's great need to increase per capita protein consumption.

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"The not-so-silent sea," by Frank T. Dietz, article, Maritimes, vol. 9, no. 2, spring 1965, pp. 10-12, illus., printed. Graduate School of Oceanography, University of Rhode Island, Kingston, R. I. 02881.

#### FISHWAYS:

"Pitlike fish ladder," by V. P. Kulikov, article, Rybnoe Khoziaistvo, vol. 40, no. 6, 1964, pp. 85-86, printed in Russian. Rybnoe Khoziaistvo, V. Krasnol'skaia 17, Moscow B-140, U.S.S.R.

#### FLORIDA:

(Florida Board of Conservation) Second Biennial Report, 1963-1964, 105 pp., illus., printed, March 1, 1965. Division of Administration, Florida Board of Conservation, W. V. Knott Bldg., Tallahassee, Fla. Summarizes activities of the Board of Conservation's divisions of Administration, Salt Water Fisheries, Water Resources and Conservation, Waterways Development, Geology, and Beaches and Shores during calendar years 1963 and 1964. Commercial fishing is one of the State's great industries, with an annual gross income of more than \$100 million, involving 150,000 people engaged in taking, processing, transporting and marketing fishery products. Division of Salt Water Fisheries accomplishments included law enforcement work and research--red tide studies, oyster rehabilitation and depuration, fish tagging, report on accidental introduction of piranha into Florida waters, and other exploratory and biological activities. Marketing and production assistance and promotion of fishery products were highly emphasized during the biennium. The Legislature provided for the use of profits from oystershell sales, previously earmarked for biological research only, in the financing of a market promotion program for the seafood industry. Included in the report are statistical data on commercial fishing licenses issued, oyster leases granted, and spiny lobster and stone crab landings. Some other activities of the Board were dumping of auto bodies offshore to form artificial reefs, dredging and maintenance of waterways, and conservation of fresh-water resources. The newly-created Division of Beaches and Shores enforced provisions of the law relating to preservation, conservation, and restoration of beaches and shore, including control of beach erosion and protection against hurricane and storm damage.

Summary of Florida Commercial Marine Landings, 1963, 23 pp., processed, Nov. 1964. Board of Conservation, Salt Water Fisheries Division, Marine Fisheries Research, Tallahassee, Florida.

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#### FOOD AND AGRICULTURE ORGANIZATION:

The Food and Agriculture Organization has published reports describing that Agency's activities under the Expanded Program for Technical Assistance for developing the fisheries of many countries. These reports have been processed only for limited distribution to governments, libraries, and universities. Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy:

Informe al Gobierno de Nicaragua sobre Mejoramiento de las Técnicas de Pesca en el Lago de Managua y Otras Aguas Continentales, 1961-62 (Report to the Government of Nicaragua on Improving Fishing Techniques in Lake Managua and Other Inland Waters, 1961-62), by Dietmar R. Riedel, EPTA Report No. 1885, 59 pp., illus., in Spanish, June 1964.

Rapport au Gouvernement du Mali sur l'Amélioration de l'Industrie du Traitement du Poisson (Report to the Government of Mali on Improving the Fish Processing Industry), by Moustafa Aref, EPTA Report No. 1914, 57 pp., illus., in French, July 1964.

Proceedings of the World Scientific Meeting on the Biology of Tunas and Related Species, FAO Fisheries Reports No. 6, vol. 4, 427 pp., processed in French, Spanish, and English, 1964. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

#### FRANCE:

"Exportations" (Exports), article, France Pêche, no. 94, April 1965, pp. 28-30, printed in French, France Pêche, Boite Postale 179, Lorient, France, single copy 2.5 F. (about US\$0.50). Consists of tables comparing quantities and values of fishery products exported in 1963 and 1964.

The following articles are from La Pêche Maritime, vol. 44, no. 1045, April 1965, printed in French, single copy 14 francs (US\$2.85). La Pêche Maritime, 190, Blvd. Haussmann, Paris 8<sup>e</sup>, France:

"Une conférence de M. Jacques Huret sur l'adaptation de l'industrie de la pêche à l'évolution économique et sociale des grandes villes" (A commentary from M. Jacques Huret on the adaptation of the fishing industry to the social and economic evolution of large cities), pp. 236-238, illus.

"1965 sera une année difficile mais 1966 doit marquer le début d'une période nouvelle" (1965 will be a difficult year, but 1966 could mark the beginning of a new era), by Jean Morin, pp. 232-235.

"1964 aurait dû être une année test; ce fut, une nouvelle fois, une période d'attente" (1964 was supposed to have been a test year; it was again, however, a period of waiting), by M. Parquic, pp. 226-231.

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"Custom freeze-drying services means to increased profits," by W. L. Porter and W. L. Root, article, Canner Packer, vol. 133, no. 29, June 1964, p. 32, printed, single copy 50 cents. Vance Publishing Co., 59 E. Monroe St., Chicago, Ill. 60603.

"Freeze vacuum drying of marine products. III--Test on salmon meat," by Kiichiro Kobayashi and Shuzo Igarashi, article, Bulletin of the Faculty of Fisheries, Hokkaido University, vol. 14, no. 4, 1964, pp. 209-214, printed, Faculty of Fisheries, Hokkaido University, Kameda-Machi, Hakodate, Japan.

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#### FREEZERSHIP:

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#### FRESH-WATER FISH:

Familiar Freshwater Fishes of America, by Howard T. Walden II, 336 pp., illus., printed, 1964. Harper and Row, Publishers, 49 E. 33rd St., New York, N. Y. 10016.

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"Possibilities of raising frogs on commercial scale," article, Australian Fisheries Newsletter, vol. 24, no. 5, May 1965, pp. 23-25, illus., printed. Fisheries Branch, Department of Primary Industry, Canberra, A. C. T., Australia.

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Effect of Polyphosphates and Other Salts on Drip Loss and Oxidative Rancidity of Frozen Fish, by J. W. Boyd and B. A. Southcott, 15 pp., printed. (Reprinted from the Journal of the Fisheries Research Board of Canada, vol. 22, no. 1, 1965, pp. 53-67.) Queen's Printer and Controller of Stationery, Ottawa, Canada.

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Control and Measuring Gear on Board Vessels, by P. I. Bendik and A. M. Lapidus, 272 pp., printed in Russian, 1964. Voenizdat, Moscow, U.S.S.R.

Articles from Rybnoe Khoziaistvo, vol. 40, 1964, printed in Russian. Rybnoe Khoziaistvo, V. Krasnosel'skaia 17, Moscow B-140, U.S.S.R.:

"Exhibition of equipment used by fish enterprises," by V. Solov'eva, no. 6, pp. 90-91.

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"Nuevos métodos de industrialización de merluza en Chile, II--Conserva de productos ahumados" (New methods of processing hake in Chile. II--Canned dried products), by Enrique Torrejón, article, Información Conservera, vol. 13, no. 134, Feb. 1965, pp. 52, 53-56, illus., printed in Spanish, single copy 30 ptas. (about US\$0.50). Información Conservera, Colón, 62, Valencia, Spain.

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Contributions, Herring Symposium, Copenhagen, 1961, edited by B. B. Parrish, 293 pp., printed, 1963. Proceedings of the International Council for the Exploration of the Sea, Charlottenlund-Slot, Charlottenlund, Denmark.

Estimation of the State of Resources of the Atlantic-Scandinavian Herring, by Yu. Yu. Marti, S. S. Federov and I. G. Yudanov, Translation No. 51, 7 pp., illus., printed, 1964. (Translated from the Russian, Soviet Fisheries Investigations in North European Seas, 1960, pp. 399-404.) Fisheries Laboratory, Ministry of Agriculture, Fisheries and Food, Lowestoft, Suffolk, England.

"Sildarleit og sildargöngur 1964" (Exploratory herring cruises and occurrence of herring schools, 1964), by Jakob Jakobsson, article, Aegir, vol. 58, no. 4, March 1, 1965, pp. 83-90, illus., printed in Icelandic. Aegir, Fiskifélags Íslands, Reykjavík, Iceland.

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"Centrifugal method of isolation of fat from the flesh of salted herring," by A. A. Lyubavina, p. 75.

"Mechanized herring line on the floating factory Skala," by K. I. Karpov, pp. 65-68.

"Search for herring with commercial vessels operating in the Atlantic," by S. Edemskii, p. 44.

#### ICELAND:

"Icelandic fishing vessels. Part Two," by Hjalmar R. Bardarson, article, Iceland Review, vol. 3, no. 1, 1965, pp. 19, 21, 23-24, illus., printed, single copy 50 Kr. (about US\$1.15). Iceland Review, P.O.B. 1238, Reykjavík, Iceland. Covers in detail the 4 types of Icelandic vessels in the fisheries--open motor boats, decked steam and motor vessels under 100 gross registered tons (short), decked vessels over 100 GRT, and deep-sea trawlers. All vessels of 150-350 GRT are built of steel and are equipped for both long-lining and purse-seining for herring and cod, with a power-block. Safety features required by the Icelandic Directorate of Shipping include vessel stability provisions, particularly for purse-seiners; water-tight closing of a full-strength poop on the after main deck; and a complete set of stability calculations for each newly constructed vessel. Steering efficiency, providing for maneuvering the vessel in a tight circle when shooting the net, is increased in purse-seiners by the use of large rudder areas, and experimentally by an active-rudder and a bow-thruster. Trawlers are not used as frequently as

formerly since their catches have been poor in the past few years. Fishing vessels are in a continual state of development; the trend is to further mechanize fishing and to make it safer by the use of better equipped vessels, concludes the author.

#### ILLINOIS:

A Biological Investigation of the Fishes of Lake Chautauqua, Illinois, by William C. Starrett and Arnold W. Fritz, Illinois Natural History Survey Bulletin, vol. 29, art. 1, 108 pp., illus., printed, March 1965. Illinois Natural History Survey, Natural Resources Bldg., Urbana, Ill.

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"A cheese-like product from fish," by M. A. Krishnaswamy and others, article, Journal of Food Science and Technology, India, vol. 1, no. 1, 1964, p. 1, printed. Association of Food Technologists, Central Food Technological Research Institute, Mysore 2, India.

International Association of Fish Meal Manufacturers News Summary, no. 16, Jan. 1965, 162 pp., illus., processed, distribution restricted. International Association of Fish Meal Manufacturers, 70 Wigmore St., London W1, England. Contains among others, the following articles: "Studies on the incidence of salmonella germs in imported fish meal," by J. Jacobs and others; "Preparation of refined fish flour," by G. M. Dreosti and Alison Atkinson; "The amino acids of the most important fish meals," by A. de Vuyst and others; "Relationship between protein quality in fish meals, as shown by the 'available lysine' figure, and the condition of the fat, as shown by the free fatty acid content and peroxide value," by Harry Pritchard; "Extracted herring meal as sole protein supplement," by Willy Hansen; and "Studies on sardine oil."

#### INSULIN:

"Isolation of insulin from the fish, Lophius piscatorius by gel filtration," by Rene E. Humbel, article, Chemical Abstracts, vol. 59, Oct. 28, 1963, Abstract No. 10415, printed. American Chemical Society, 1155 16th St. N.W., Washington, D. C. 20006.

#### INTERNATIONAL AGREEMENTS:

Fisheries, King Crab, Agreement between United States and Union of Soviet Socialist Republics, Signed Washington, Feb. 5, 1965 (Entered into Force Feb. 5, 1965). Treaties and Other International Acts Series, No. 5752, 11 pp., printed in Russian and English, 1965, 10 cents. Department of State, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

#### IRRADIATION PRESERVATION:

Current Status & Commercial Prospects for Radiation Preservation of Food, TID 21431, 183 pp., illus., printed, Jan. 1965, 55 cents. Business & Defense Services Administration, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) The preservation of food by ionizing radiation is fast approaching com-

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mercialization, and within the decade irradiation will be recognized as a major preservation technique, concludes this report prepared for the Atomic Energy Commission. Of the 28 products covered in the study in connection with 6 irradiation processes, 17 (including marine products) were found to have either good or excellent prospects for domestic or international markets. The study also indicates the direction and magnitude of changes or problems which may affect other food processing industries as adoption of the radiation technique increases. It includes an analysis and discussion of international aspects, Government regulations, consumer reaction, and other factors involved in the development of the irradiation preservation industry. It states that Major benefits of this new method will be felt in areas not reached by other processes. Irradiation preservation is expected to replace some present methods of preservation and to be used in combination with other processes. The benefits anticipated include elimination of food-borne hazards to health; availability of new and more convenient foods; improvement in food quality; savings from reductions in spoilage; and market expansion as the result of extensions of shelf life and shipping distances. The value of all the efforts and expenditures by Government during the past decade will depend on development of commercial production capacities by private firms in the next decade, states the report. This is the first of a series which will include analyses of the economics and logistics of feeding irradiated foods to soldiers.

The Determination of the Wholesomeness of Irradiation-Pasteurized Clams. Final Summary, June 1963-August 1964, by E. F. Reber, TID 21226, 77 pp., printed, 1964. Technical Information Division, U.S. Atomic Energy Commission, Washington, D. C. 20545.

"Irradiated foods laws: meeting in Rome, April 21-28, 1964," article, *Nuclear Engineering*, vol. 9, 1964, pp. 97, 217, printed. Temple Press Ltd., Bowling Green Lane, London EC1, England.

Irradiation des Aliments (Food Irradiation), vol. 5, no. 3, Jan.-March 1965, 25 pp., illus., processed. Centre European d'Information pour l'Irradiation des Aliments, B. P. No. 6, Gif-sur-Yvette (S.-et-O.), France. (For sale by the O.E.C.D. Mission, Suite 1223, 1346 Connecticut Ave. NW., Washington, D. C. 20006.) Some of the articles are: "Data on wholesomeness studies--a progress report," by Nicholas Raica Jr.; "Studies on food irradiation in Japan"; and "Irradiation extends storage life of Bombay duck (*Harpodon nehereus*)."

Reports prepared by Division of Technical Information Extension, U. S. Atomic Energy Commission, Oak Ridge, Tenn. (For sale by the Clearinghouse for Federal Scientific and Technical Information, U. S. Department of Commerce, Port Royal and Braddock Rds., Springfield, Va. 22151.):

Effect of Irradiation on the Microbial Flora Surviving Irradiation Pasteurization of Seafoods--Final Summary, May 1963-April 1964, by R. O. Sinnhuber and J. S. Lee, SAN-100-1, 63 pp., illus., processed, Nov. 1964, \$3. This annual report contains results of research conducted by the Department of Food Science

and Technology, Oregon State University. Objectives of the studies are to: (1) examine the shift in the natural microbial flora (including yeasts and molds) due to the variation in irradiation resistance and to determine (a) the spoilage of those organisms, (b) their pathogenicity; (2) determine whether any of the organisms which survive are mutants, and their role, if any, in spoilage; and (3) investigate the complementary effects of approved food additives such as nitrites and other radiolethal agents. Dover sole (*Microstomus pacificus*) filets were chosen as the first fishery product to be investigated. The storage life for a given radiation dose, states the report, depends on the initial number and types of organisms. Therefore, the radiation pasteurization can be more successful when the microbiological quality of the fresh fish samples is controlled. The shelf life of irradiated Dover sole can be further extended by the use of 0.1 percent sodium benzoate as an additive.

Radiation Pasteurization of Foods--Summaries of Accomplishment, Presented at Fourth Annual Contractors' Meeting, October 21-22, 1964, Conf-641002, 207 pp., processed, 1965, \$6. Some of the articles are: "Simultaneous radiation heating treatment of haddock," by J. T. R. Nickerson; "Study of radiation pasteurized products," by L. J. Ronsivalli; "Radiation pasteurization of Pacific crab and flounder," by D. Miyauchi; "Effects of ionizing radiation on lipids of fish," by M. E. Standsby; "Radiation pasteurization of Gulf shrimp and oysters," by Arthur F. Novak; "Irradiation preservation of fresh water fish," by H. L. Seagran; "The effect of radiation on the microbial flora surviving irradiation pasteurization of seafoods," by R. O. Sinnhuber; "Extractive studies on packaging materials to be used with irradiated foods," by E. A. Garlock; "Current status and prospects for the commercialization of radiation preservation of food," by J. M. Schaffer; and "The determination of the wholesomeness of irradiation pasteurized clams," by E. F. Reber. Also includes articles on: "The effects of gamma rays on haddock and clams inoculated with *Clostridium botulinum*, Type E," by J. T. R. Nickerson; "A study of the effect of ionizing radiation on resistance, germination and toxin synthesis of *Clostridium botulinum* spores, Types A, B and E," by J. T. Graikoski; "Growth characteristics of Type E. *Clostridium botulinum* in the temperature range of 34° to 50° F.," by W. P. Segnor; "The significance of *Clostridium botulinum* Type E in the application of radiation-pasteurization to Pacific crab meat and flounder," by M. W. Eklund; "Examination of Gamma irradiated Gulf shrimp for *Clostridium botulinum* and Type E toxin," by R. M. Grodner; "Basic microbiological and biochemical factors in radiation pasteurization of marine products," by A. M. Dollar; and "Basic radiation research," by L. J. Ronsivalli.

Articles from *Nucleonics Week*, vol. 5, no. 35, 1964. McGraw-Hill Book Co., 330 W. 42nd St., New York, N. Y. 10036:

"F. D. A. has approved 9 packaging materials for irradiated foods," p. 4.

"The marine products development irradiator will be dedicated," p. 4.

Abstracts from *Nuclear Science Abstracts*, vol. 18, 1964. U. S. Atomic Energy Commission, Washington,

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D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402):

"Codfish and sweet potato--Report of observations on nutrition: radiation and sterilization of foods for Auburn University, Auburn, Alabama," by M. A. Ross, Abstract No. 11640.

"Corn and tuna diet--Report of observations on nutrition: radiation and sterilization of foods for Hazelton Laboratories, Falls Church, Virginia," by M. A. Ross, Abstract No. 11641.

#### ITALY:

Market Factors in Italy, by Fernande Lavallee, OBR 65-23, 12 pp., printed, April 1965, 15 cents, Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

#### JAPAN:

Fisheries Statistics of Japan, 1963, 65 pp., illus., processed, March 1965. Statistics and Survey Division, Ministry of Agriculture and Forestry, 1-2 chome, Kasumigaseki, Chiyoda-ward, Tokyo, Japan. Contains Japanese production statistics by type of fishery and species, 1963. Also data on fisheries enterprises, vessels, processing, and foreign trade. Types of fisheries include marine--trawling, salmon drift-net, king crab gill-net, tuna long-line, skip-jack pole-and-line, purse seine, Pacific saury dip-net, and set-net; aquaculture--pearl, oyster, seaweed; and whaling. The Annual Report of Catch Statistics on Fishery and Aquaculture, issued yearly until 1963, will be published henceforth in 2 separate volumes; one written in Japanese for domestic users and this report in English for foreign users.

Bulletin of the Japanese Society of Scientific Fisheries, vol. 31, 1965, printed in Japanese with English abstracts. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba Kaigandori 6, Minato-ku, Tokyo, Japan.

no. 1, Jan., 107 pp., illus. Contains, among others, articles on: "Studies on the resources of the jack mackerel, *Trachurus japonicus* (Temminck et Schlegel), in the East China Sea. II--Fishing efficiency of purse seiner of one-boat and two-boat operation types," by F. Mitani and E. Ida; "Studies on flavor of 'katsuobushi' I--On the acidic, basic and phenolic components, II--Relations between flavors of 'smoke' and of 'katsuobushi,'" by K. Nishibori; "Studies on fish-solubles. II--Nutritive value of commercial fish-solubles in rats and mice," by T. Onishi, S. Murayama, and T. Kaneda; "Studies on the biological formation of formaldehyde and dimethylamine in fish and shellfish. V--On the enzymatic formation in the pyloric caeca of Alaska pollock," by K. Yamada and K. Amano (in English); and "Bacterial permeability of tin-sealed sausage casing," by M. Nakaide and others.

no. 2, Feb., 81 pp., illus. Some of the articles are: "Age composition of Atlantic tunas related with distribution of water temperature and distance from land. I--Yellowfin tuna; II--Albacore," by J. Nakagome and others; "Studies on the

small coastal gill-net fisheries and their resources. VI--Characteristics of the catch and fishing ground on the stopping-net (egiri-ami) fishery, VII--Ecological study of the fish population caught by the stopping-net (egiri-ami)," by T. Shiokawa; "Studies on the new nitrofurans derivatives as food preservatives. I--On the preservative effect of AF-2 and AF-5, II--A study on the chemical assay of nitrofurazone (F) and AF-2," by A. Obatake and others; "Studies on the effects of marine products on cholesterol metabolism in rats. IV--Fractionation of effective substances from purple laver (1)," by T. Kaneda and K. Arai; and "Studies on 'green' tuna. I--The significance of trimethylamine oxide," by C. Koizumi and Y. Hashimoto (in English).

no. 3, March, 94 pp., illus. A few of the articles are: "Experimental use of fish pumps. VI--An attempt in using fish pump as pond cleaner," by H. Soeda and others; "On the anatomy and function of stomach of Japanese pearl oyster, *Pinctada martensii* (Dunker)," by Y. Kuwatani (in English); "Studies on the source of shellfish poison in Lake Hamana. I--Relation of the abundance of a species of dinoflagellate, *Prorocentrum* sp. to shellfish toxicity, II--Shellfish toxicity during the 'red-tide,'" by M. Nakazima (in English); and "Studies on new nitrofurans derivatives as food preservatives. III--Bioassay for AF-2 in foods, IV--On the behavior of AF-2 and nitrofurazone in fish sausage processing," by A. Obatake and T. Matsuda.

#### KING CRAB:

Movements of Tagged Crabs PARALITHODES CAMTSCHATICA (Tilesius) in the Kodiak Island-Lower Cook Inlet Region of Alaska, 1954-63, by Guy C. Powell and Richard E. Reynolds, Informational Leaflet 55, 10 pp., illus., processed, April 30, 1965. Department of Fish and Game, Subport Bldg., Juneau, Alaska 99801.

#### LABOR LEGISLATION:

Information on the Equal Pay Act of 1963, WHPC Publication 1104, 10 pp., printed, May 1965. Wage and Hour and Public Contracts Divisions, U. S. Department of Labor, Washington, D. C. 20210. The 1963 amendment to the Fair Labor Standards Act requires that men and women performing equal work must receive equal pay. This pamphlet outlines the types of jobs to which the equal pay provisions apply (generally those concerned with interstate and foreign commerce), what is meant by "equal pay" and "equal work," and what action can be taken by any person who has a question about the applicability of the equal pay standard.

#### LATIN AMERICA:

"La pesca y el problema alimenticio de la America Latina" (The fisheries and the food problem in Latin America), article, Industrias Pesqueras, vol. 39, no. 907, Feb. 1, 1965, pp. 56-57, printed in Spanish, single copy 50 ptas. (about US\$0.85). Industrias Pesqueras, Apartado 35, Vigo, Spain.

#### LIBYA:

Foreign Trade Regulations of the Kingdom of Libya, OBR 65-29, 8 pp., printed, May 1965, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)



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#### MACKEREL:

Influence of External Factors on the Schooling of Jack Mackerel in the Gulf of Aden, by V. V. Nekrasov, JPRS 25966, 3 pp., processed, 1964. (Translated from the Russian, *Okeanologiya*, vol. 4, no. 3, 1964, pp. 477-478.) Clearinghouse for Federal Scientific and Technical Information, U. S. Department of Commerce, Port Royal and Braddock Rds., Springfield, Va. 22151.

"Vliyaniye vneshnikh faktorov na skopleniya stavridy v Adenskom zalive. (Po materialam 2-i ekspeditsii Azovo-Chernomorskogo nauchno-issledovatel'skogo instituta morskogo rybnogo khozyaistva i okeanografii v Indiskii okean)" (Effect of external factors on the accumulation of horse mackerel, Carangidae, in the Gulf of Aden--From the findings of the Second Expedition of the Azov-Black Sea Research Institute for Marine Fisheries and Oceanography in the Indian Ocean), by V. V. Nekrasov, article, *Okeanologiya*, vol. 4, no. 3, 1964, pp. 477-478, illus., printed in Russian, *Akademiia Nauk SSSR*, Moscow, U.S.S.R.

#### MOLLUSKS:

Effects of Synthetic Surfactants on the Larvae of Clams (M. MERCENARIA) and Oysters (C. VIRGINICA), by Herbert Hidu, 9 pp., printed, Reprinted from *Journal Water Pollution Control Federation*, Feb. 1965, pp. 262-270, Water Pollution Control Federation, 4435 Wisconsin Ave., Washington, D. C. 20016.

#### MUSSELS:

Tennessee River Mussel Investigation--A Progress Report, F65Fr1, 4 pp., printed, 1965. Tennessee Valley Authority, Fish and Wildlife Branch, Norris, Tenn. Discusses the investigation started in July 1963 by the TVA to determine the causes of mussel population depletion in the Tennessee River. Although the investigation is still not complete, the evidence to date points toward several causes, according to this leaflet. Overharvesting, changes in habitat (lack of current or impoundment), pollution, and siltation are all factors in the decline of the mussel population and consequent drop in production of the commercially valuable shell. Regulatory measures suggested to reverse the trend include licensing of operators, limiting the size of harvested shell, control over harvesting gear, limiting operations to daylight hours, and designating sanctuaries where mussels would be undisturbed.

#### NORTHWEST ATLANTIC:

Fishery on Georges Bank, by V. Tutichev, 43 pp., printed in Russian, 1964. Knizhnoe Izdanie, Kaliningrad, U.S.S.R.

Fishes of the Western North Atlantic, Part 4, 600 pp., illus., printed, 1965, \$27.50. Sears Foundation for Marine Research, Bingham Oceanographic Laboratory, Yale University, New Haven, Conn. This volume includes studies on the little known deep-sea fish, including the Sub-orders Argentinioidea, Stomatoidea, Esocoidea, Bathylaconioidea, and Order Giganturoidea.

#### NUTRITION:

Give Yourself a Break, 8 pp., illus., printed, 1965, single copy \$0.03, lots of 25 \$0.60, lots of 50 \$1.25, lots of 100 \$2. The American Dietetic Association, 620 N. Michigan Ave., Chicago, Ill. 60611. This nu-

trition leaflet for teen-agers includes fish as one of the protective animal protein foods to be eaten daily.

#### OCEANOGRAPHY:

The Atlantic Continental Shelf and Slope: A Program for Study, MTS Geological Survey Circular 481, 11 pp., illus., processed, 1963. Geological Survey, U. S. Department of the Interior, Washington, D. C. 20240.

"Exploration," by G. F. M. Smith, article, *Federal-Provincial Conference on Fisheries Development*, January 20-24, 1964, Canadian Fisheries Report No. 3, pp. 35-37, printed, 1964. Department of Fisheries, Ottawa, Canada.

"The oceanographic institute in Gothenburg, Sweden," by A. A. Kirpichnikov, article, *Okeanologiya*, vol. 4, no. 3, 1964, pp. 540-542, printed in Russian, *Okeanologiya*, *Akademiia Nauk SSSR*, Moscow, U.S.S.R.

Opportunities in Oceanography, by E. John Long, Smithsonian Publication No. 4537, 35 pp., illus., printed, revised April 1965, 50 cents. Editorial and Publications Division, Smithsonian Institution, Washington, D. C. 20560. Emphasizes the need for young people in the rapidly expanding field of oceanography. Discusses the qualities essential to a good oceanographer, his educational background, including opportunities for scholarships and research assistantships, and special opportunities for women. Covers the various fields of oceanography and the special challenges to each, while not neglecting to relate oceanography to other branches of science. Discusses the work of oceanographers on exploration, research, survey, and monitoring cruises as well as oceanographic occupations on land, ranging from laboratory technicians to statisticians and librarians. Includes a section on the active interest in oceanography taken by the Federal Government, and a section on the special interests of private industry. Finally, the future of oceanography is presented as one of ineluctable discoveries and breakthroughs which promise to reshape our way of life.

On some Oceanographic Observations in the Southeastern Caribbean Sea and the Adjacent Atlantic Ocean with Special Reference to the Influence of the Orinoco River, by Herman G. Gade, 56 pp., illus., printed in English with Spanish abstract. (Reprinted from *Boletín del Instituto Oceanográfico*, vol. 1, no. 2, Dec. 1961, pp. 287-342.) Instituto Oceanográfico, Universidad de Oriente, Apartado 94, Cumaná, Venezuela.

Systematic Basis for Forecasting Oceanological Conditions and the Spawning of Commercial Fish, by G. K. Izhevskii, 165 pp., printed in Russian, 1964. Vsesoiuznyi Nauchno-Issledovatel'skii Institut Morskogo Rybnogo Khozyaistva i Okeanografii, Verkh. Krasnosel'skaia Ul. No. 17, Moscow, U.S.S.R.

"Voyages to discovery," article, *Via Port of New York*, vol. 17, no. 4, April 1965, pp. 6-8, illus., printed. The Port of New York Authority, 111 Eighth Ave., New York, N. Y. 10011. Discusses oceanographic vessels operated out of the Port of New York by the Lamont Geological Observatory, the Military Sea Transportation Service, an American steamship line, and a contractor of the National Science Foundation. One vessel is the Anton Bruun (formerly the Presidential yacht *Williamsburg*), which returned to port early this

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year after completing a 2-year 72,000-mile biological research study of the western half of the Indian Ocean. Ninety-one American and foreign scientists conducted investigations which yielded biological information previously unknown. The ship participated in the International Indian Ocean Expedition, a project in which more than 20 nations took part. Other vessels have sailed on cruises to obtain geological data (including one which discovered a massive deposit of gemstone diamonds off the South African Coast), and physical and chemical oceanographic information.

"World Ocean Market Report," by E. W. Seabrook Hull, article, *Geo Marine Technology*, vol. 1, no. 5, April 1965, pp. 7-25, printed. INTEL, Inc., 739 National Press Bldg., Washington, D. C. 20004.

#### OYSTERS:

Abstracts from *Chemical Abstracts*, vol. 60. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006;

"Biochemical studies on *Ostrea gigas*. VIII--The iron and manganese content of meat," by A. Hayashi, Feb. 3, 1964, Abstract No. 3307f.

"A sample test for freshness of shellfish (oyster) using 2, 3, 5-triphenyltetrazolium chloride," by Taisuke Mochinaga and Akira Taguchi, Feb. 17, 1964, Abstract No. 4698g.

Chromatographic Evidence of Intraspecific Genetic Differences in the Eastern Oyster, (*CRASSOSTREA VIRGINICA*), by Robert E. Hillman, Contribution No. 252, 7 pp., printed. (Reprinted from *Systematic Zoology*, vol. 13, no. 1, pp. 12-18, March 18, 1964.) Natural Resources Institute, University of Maryland, Solomons, Md.

The Volatile Sulphur Compounds of Oysters, by A. P. Ronald, and W. A. B. Thomson, 7 pp., printed. (Reprinted from the *Journal of Fisheries Research Board of Canada*, vol. 21, no. 6, 1964, pp. 1481-1487.) Queen's Printer and Controller of Stationery, Ottawa, Canada.

#### PAKISTAN:

"Karachi's Fish Harbour achieves results," by R. D. Lee, article, *Foreign Trade*, vol. 123, no. 11, May 29, 1965, pp. 29-30, illus., printed, single copy C\$0.25. Queen's Printer, Government Printing Bureau, Ottawa, Canada. Construction of the new fish harbor and facilities at Karachi began in 1955, the market was opened in October 1959, and marketing operations began under the management of the Fishermen's Co-Operative Society. Landings are currently running about 200 tons a day, according to the author. The harbor is about 5,400 feet by 200 feet and the depth is between 10 and 14 feet. The facilities include a jetty over 1,700 feet long, equipped with cranes for loading and unloading fish. The co-operative administers the twice daily wholesale auctioning of both fresh and cured fish. In 1963, more than 4.3 million pounds of canned and frozen shrimp worth about US\$2.7 million were exported from Pakistan.

Market Factors in Pakistan, by Larry A. Niksch and Barry Wardlaw, OBR 65-24, 12 pp., printed, April

1965, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

#### PARASITES:

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#### PEARL CULTURE:

"How northern pearl farms are progressing," by V. Wells, article, *Australian Fisheries Newsletter*, vol. 24, no. 6, June 1965, pp. 23-26, illus., printed. Fisheries Branch, Department of Primary Industry, Canberra A.C.T., Australia.

#### PIRANHA:

"El Brasil contra las pirañas" (Brazil versus the piranhas), by Blas Venegas, article, *Iberica*, vol. 43, no. 34, April 1965, pp. 126-128, illus., printed in Spanish, single copy 18 ptas. (about US\$0.30). *Iberica*, Palau, 3, Apartado 759, Barcelona-2, Spain.

#### PLANKTON:

Some Euphausiids from the Gulf of Paria, Gulf of Cariaco, and the Orinoco Delta, Eastern Venezuela, by J. E. Henri Legare, 18 pp., illus., printed in English with Spanish abstract. (Reprinted from *Boletín del Instituto Oceanográfico*, vol. 1, no. 1, July 1961, pp. 3-20.) Instituto Oceanográfico, Universidad de Oriente, Apartado 94, Cumana, Venezuela.

#### POLAND:

"Centromor<sup>1</sup> of Poland--amongst the finest fishing vessels and equipment in the world," by J. Swiecicki and W. Piltz; "Review of achievements of Polish fishing"; "Motherships built by Poland"; "Development of factory trawlers in Poland"; "Fishing schools in Poland and research work of Marine Fishing Institute," articles, *Fishing News*, no. 2712, May 28, 1965, pp. i-vii, illus., printed, single copy 9 d. (about US\$0.10). Fishing News, A. J. Heighway Publications, Ltd., Ludgate House, 110 Fleet St., London EC4, England.

"The expansion plan of Polish fishing fleet," article, *Polish Maritime News*, vol. 8, no. 80, April 1965, pp. 19-20, illus., printed. Maritime Branch, Polish Chamber of Foreign Trade, ul. Pulaskiego 6, Gdynia, Poland. The prospective expansion of the Polish fishing fleet is based on the demand for protein for nutritive and stock-breeding purposes, according to the author. A modern fishing fleet is a fundamental element in the development of sea fisheries and is a prerequisite to full utilization of the fish landed. The extension of the fishing fleet in 1966-70 will be coordinated with construction of shore bases. During that period, new vessels built will include 19 factory-trawlers, 10 freezer-trawlers, 16 trawlers with freezing equipment, 4 tuna vessels, 25 large cutters, 45 small cutters, 3 motherships, and 2 refrigerated fish-transporters. This new fleet will have a catching potential of about 225,000 metric tons of fish a year. Principal species landed will be cod, flatfish, ocean perch, herring, sprat, sardines, tuna, and mackerel. It is expected that more than 70 percent of the fish

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caught will be frozen on board, which will guarantee high quality in the fish landed at ports.

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Pond Fishing, by T. T. Solov'ev, 131 pp., printed in Russian, 1964. Pishchevaya Promyshlennost', Moscow, U.S.S.R.

#### PORTUGAL:

"Plan intercalar de fomento pesquero para 1965-1967 (Projected plan of fishery development for 1965-67), article, Industrias Pesqueras, vol. 38, no. 903, Dec. 1, 1964, pp. 526-528; no. 904, Dec. 15, 1964, pp. 550-551, printed in Spanish, single copy 50 ptas. (about US\$0.85). Industrias Pesqueras, Apartado 35, Vigo, Spain.

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Boiling Fish for Short Term Preservation, edited by G. N. Subba Rao, Regional Study No. 1, 21 pp., illus., processed, March 1965. Indo-Pacific Fisheries Council, Food and Agriculture Organization of the United Nations, Regional Office for Asia and the Far East, Maliwan Mansion, Phra Atit Rd., Bangkok, Thailand.

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"Proteins from prawn shell waste," by P. V. Kamasastri and P. V. Prabhu, vol. 59, Oct. 14, 1963, Abstract No. 9243e.

#### PURSE SEINING:

"Observation on Icelandic purse seining expedition," by M. Ya. Groisman, article, Rybnoe Khoziaistvo, vol. 40, no. 6, 1964, pp. 60-64, printed in Russian. Rybnoe Khoziaistvo, V. Krasnosel'skaia 17, Moscow B-140, U.S.S.R.

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on Fisheries Development, January 20-24, 1964, Canadian Fisheries Report No. 3, pp. 75-77, printed, 1964. Department of Fisheries, Ottawa, Canada.

#### SALMON:

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Length-Weight Relationship of Mature Bristol Bay Sockeye Salmon in 1963, by Ole A. Mathisen, Informational Leaflet No. 56, 8 pp., illus., processed, May 8, 1965.

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The Value of Sharp Rings for the Age Determination of Sardine (SARDINA PILCHARDUS Walb.), by R. Muzinic, General Fisheries Council for the Mediterranean Study No. 25, 10 pp., illus., processed, Dec. 1964, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

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"The calico scallop community in North Carolina," by Harry W. Wells, Mary Jane Wells and L. E. Gray, article, Bulletin of Marine Science of the Gulf and Caribbean, vol. 14, no. 4, 1964, pp. 561-593, illus., printed, Marine Laboratory, University of Miami, #1 Rickenbacker Causeway, Miami, Florida 33149.

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"Tasmanian scallop fishery and its future," by A. J. Harrison, article, Australian Fisheries Newsletter, vol. 24, no. 6, June 1965, pp. 9, 11, 13, illus., printed, Fisheries Branch, Department of Primary Industry, Canberra A.C.T., Australia. Reviews the history of the scallop industry in Tasmania and current conditions in that fishery. In the past 40 years, the fishery has undergone many changes; landings rose to 30 million scallops in 1961, then began to decline. Catch per-unit-of-effort has declined since 1957, and the main fishing grounds have switched from the D'Entrecasteaux Channel to ocean beds off the East Coast. Major cause of the change was biological--the Channel beds appeared to suffer a sudden and drastic decline in population, and this, coupled with the irregular recruitment of scallops, decimated the stocks. These sudden declines are not uncommon in molluscan populations, particularly in oyster and mussel beds, according to the author. Although the cause is not well understood, virus infections are sometimes suspected. "So it is likely that in the future we will have a heavy fishery operation over a long strip of coast . . .," concludes the author.

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Annual Report for 1964, 19 pp., printed, Institute of Seaweed Research, Inveresk, Midlothian, Scotland. Covers developments in the British and foreign seaweed byproducts industries during 1964, and the Institute's information and technical assistance services. Summarizes British production of alginates from seaweed, use of seaweed meal in animal feed-stuffs, and sales of fertilizers from seaweed. Highlights the extension of the Irish seaweed industry since 1958, and presents a list of publications on seaweeds and related topics (such as alginates) issued during 1964.

Use of Seaweeds Directly as Human Food, compiled by G. N. Subba Rao, Regional Study No. 2, 35 pp., processed, March 1965, Indo-Pacific Fisheries Council, Food and Agriculture Organization of the United Nations, Regional Office for Asia and the Far East, Maliwan Mansion, Phra Atit Rd., Bangkok, Thailand.

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New Shellfish Farming, by Victor L. Loosanoff, 6 pp., printed, (Reprinted from Transactions of the Twenty-Ninth North American Wildlife and Natural Resources Conference, March 9, 10, and 11, 1964, pp. 332-337.) Wildlife Management Institute, Wire Bldg., Washington, D. C. 20005.

#### SHRIMP:

Elaboracion y Congelacion del Camaron en el Ecuador (Processing and Freezing of Shrimp in Ecuador), by Roar Joraholmen, Boletin Informativo, vol. 2, no. 1, 43 pp., illus., printed in Spanish, 1965, S/ 18.00 (US\$1.00). Instituto Nacional de Pesca del Ecuador (Biblioteca), Casilla 5918, Guayaquil, Ecuador.

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"Tetracycline antibiotics in shrimp preservation," by B. A. Southcott and J. W. Boyd, vol. 22, no. 1, 1965, pp. 117-129.

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Articles from The South African Shipping News and Fishing Industry Review, vol. 20, no. 5, May 1965,

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single copy 30¢ (about US\$0.45). Thomson Newspapers, South Africa (Pty.) Ltd., P. O. Box 80, Cape Town, South Africa Republic:

"Contracts awarded in big development for fishing harbours," pp. 73-74, illus.

"More than forty foreign ships are fishing off South African coast," pp. 75, 77-78, illus.

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Lists under "Turkey" submitted by Suleyman Arisoy, Fisheries Advisor, T. C. Ziraat Bankası, Genel Müdürlük, Musavir Müdür Muavini (Suurunleri ve Kredileri), Ankara, Turkey.

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Fishes and Their Ways, by Clarence J. Hylander, illus., printed, 1964, \$4.95. The Macmillan Company, 60 Fifth Ave., New York, N. Y. 10011. For ages 11 or 12 and up.

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Catch and Processing of Commercial Invertebrates from the Far-Eastern Seas, by I. V. Kizeveter, 224 pp., printed in Russian, 1962. Primorskoe Knozhnoe Izdatel'stvo, Vladivostok, U.S.S.R.

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Cybernetics in Fishing Industry, Important Problem, USSR, by F. K. Rudnev, TT 65-30645, 8 pp., processed, April 2, 1965, \$1. (Translated from the Russian, *Rybnoe Khoziaistvo*, no. 1, 1965.) Clearinghouse for Federal Scientific and Technical Information, U. S. Department of Commerce, Port Royal and Braddock Rds., Springfield, Va. 22151.

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, vol. 1, no. 2, 1965, 72 pp., illus. A few of the articles are: "Rate of the growth and productive possibilities of fish populations," by V. N. Grese; and "Specific peculiarities of the susceptibility and resistance of fish to phenol," by V. I. Lukyanenko and B. A. Flerov.

Identification Key to the Commercial Fishes of the U.S.S.R. (Teaching Manual for Ichthyologists, Experts, and Higher Learning Institutes), Fourth Revision, by P. G. Borisov and N. S. Ovsyannikova, 319 pp., printed in Russian, supplemented edition 1964. Pishchevaya Promyslennost', Moscow, U.S.S.R.

Soviet Ichthyological Research (articles), TT 65-30658, 106 pp., illus., processed, April 6, 1965, \$4. (Translated from the Russian, *Voprosy Ikhtiologii*, vol. 4, no. 4, 1964.) Clearinghouse for Federal Scientific and Technical Information, U. S. Department of Commerce, Port Royal and Braddock Rds., Springfield, Va. 22151.

Soviet Oceanography 1964: A Trip Report, by R. S. Dietz, 24 pp., printed, April 1965. Public Information Division, Coast and Geodetic Survey, U. S. Department of Commerce, Washington Science Center, Rockville, Md. 20852. From September 14-October 9, 1964, a 6-man delegation of marine scientists, including the author, visited the Soviet Union as part of a U. S.-U.S.S.R. scientific exchange mission. During their 4-week stay, the group visited research centers in Moscow, Leningrad, Murmansk, and in the Black Sea ports of Sevastopol, Yalta, and Gelendzhik. This report gives the general impressions gained by the author during the trip; appraises the Soviet effort in oceanography; and describes institutions and installations visited, their work, and their place in the Soviet oceanographic program. There are now about 1,200 oceanographers in the Soviet Union, according to the author. Four out of about 40 universities offer training in oceanography, 2 in Leningrad and one each in Moscow and Vladivostok. The Soviet oceanographic program in the Arctic Ocean is unique in

its scope. A great strength of Soviet oceanography is the amount of support provided scientists by technicians. Each senior scientist has 5-10 assistants, which makes possible thorough evaluation of data collected. Every year, the U.S.S.R. sends a fleet of nearly 300 ships and 15,000 fishermen to Georges Bank, off the New England coast. About 50 tons of fish are landed daily during the season. The Russians operate the world's only nonmilitary research submarine, the *Severyanka*, which is used for oceanographic work in the Arctic and North Atlantic Oceans.

On the Way Towards Cheap Fish; Collection of Articles on Economy and Methods, by G. Chernyavskii, 120 pp., printed in Russian, 1962. Sakhalinskoe Knizhnoe Izdatel'stvo, Sakhalinsk, U.S.S.R.

Ways of Decreasing the Fixed Cost of Production in the Trawling Fleet, by G. T. Metelitsyn, and A. P. Petrova, 79 pp., printed in Russian, 1962. Knizhnoe Izdanie, Murmansk, U.S.S.R.

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"Oceanological investigations on the R/V *Zhemchug* along the continental slope," by D. E. Gershanovich and B. N. Kotenev, pp. 729-731.

"Scientific conference of the Oceanographic Commission of the Academy of Sciences of the U.S.S.R.," by R. B. Mamaeva, pp. 727-728.

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"The U. S. R/V John Elliot Pillsbury," by A. N. Kosarev, article, *Okeanologiya*, vol. 4, no. 3, 1964, pp. 545-546, printed in Russian. *Okeanologiya*, Akademiia Nauk SSSR, Moscow, U.S.S.R.

#### WEATHER CHARTS:

Eureka to Point Conception, Calif., 1965, 2 pp., illus., processed, 1965, 10 cents. Weather Bureau, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Chart shows stations displaying small craft, gale, whole gale, and hurricane warnings; explanations of warning displays; and schedules of AM and FM radio, TV, and radiophone stations that broadcast weather forecasts and warnings.

#### WHALES:

Articles from *Vtoroe Vsesoyuznoe Soveshchanie po Izuucheniyu Morskikh Mlekopitayushchikh*, 1963 (The Second All-Union Conference for the Study of Marine Mammals, 1963), printed in Russian, 1963. Akademiia Nauk SSR, Moscow B-140, U.S.S.R.:

"Kosatka Yuzhnogo polushariya" (The killer whale of the Southern Hemisphere), by M. M. Sleptsov, pp. 40-41.

"Malyi polosatik Yuzhnogo polushariya" (The Minke whale in the southern hemisphere), by M. M. Sleptsov, pp. 41-42.

"Pitanie usatykh kitov v osnovnykh promyslovnykh raionakh Mirovogo okeana" (The diet of baleen whales

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in the main fishing regions of the world ocean), by S. K. Klumov, pp. 22-24.

"O strukture stada zubchatykh kitoobraznykh (Odontoceti)" (The structure of the stock of the toothed whales (Odontoceti)), by V. M. Bel'kovich and A. V. Yablokov, pp. 4-5.

#### WHALING:

"Death of the big whales?" by John Hillaby, article, New Scientist, vol. 26, no. 442, May 6, 1965, pp. 358-360, illus., printed, single copy 1s. 3d. (about US\$0.20). Cromwell House, Fulwood Pl., High Holborn, London WC1, England.

"Preliminary survey of whaling operations in the Antarctic in season 1964/65," article, Norsk Hvalfang-

st-Tidende (The Norwegian Whaling Gazette), vol. 54, no. 4, April 1965, pp. 82-88, 91, printed in Norwegian and English. Hvalfangerforeningen, Sandefjord, Norway.

#### WHITEFISH:

"O rezul'tatakh introduktsii sigov (Coregonus lavaretus maraenoides Poljakow, C. lavaretus ludoga Poljakow) v ozere Sevan" (Results of the introduction of the whitefish--Coregonus lavaretus maraenoides and Coregonus ludoga--in Lake Sevan), by M. G. Dadikyan, article, Izvestia Akademii Nauk Armenian SSR Biologia Nauk, vol. 17, no. 6, 1964, pp. 41-48, printed in Russian. Izvestia Akademii Nauk Armenian SSR Biologia Nauk, Yerevan, Armenian, S.S.R.



#### VESSELS

Correction--In the August 1965 issue, page 125, Modern Fishing Vessels, the address of the publisher was omitted. The address is Clearinghouse for Federal Scientific and Technical Information, U. S. Department of Commerce, Port Royal and Braddock Rds., Springfield, Va. 22151.



#### WORLD'S FIRST NUCLEAR-POWERED LIGHTHOUSE IN SECOND YEAR OF OPERATION

The world's first nuclear-powered lighthouse has begun its second year of operation in Chesapeake Bay, Md.

An isotopic power generator developed by the Atomic Energy Commission has been providing the power for the unmanned beacon in the U. S. Coast Guard's Baltimore Lighthouse since May 20, 1964.

The nuclear generator, designated SNAP-7B, was developed under the AEC's SNAP (Systems for Nuclear Auxiliary Power) program. The program's objective is the development of small nuclear auxiliary power sources for specialized land, sea, and space uses.

The 60-watt nuclear generator, designed to operate unattended for 10 years, supplants batteries that had to be replaced every year. Since no moving parts are involved, nothing in the generator is subject to mechanical failure. The Coast Guard has reported that the performance of the "nuclear" lighthouse has been completely reliable and generally excellent.

FISHERIES EXPERTS BEING RECRUITED FOR  
TECHNICAL ASSISTANCE PROJECTS IN MANY COUNTRIES

There are many technical assistance projects in nearly all of the developing countries of the world for which the Food and Agriculture Organization (FAO) is responsible. Because the projects are expanding rapidly, there is a need for competent fisheries experts to fill the many field vacancies. The following is a list of vacancies for which FAO is now recruiting. Write to (on a confidential basis if desired): Roy I. Jackson, Director, Fisheries Division, Food and Agriculture Organization of the United Nations, Via delle Terme de Caracalla, Rome, Italy.

The following list shows the country in which the vacancy exists, the types of fisheries experts being recruited (in parentheses the approximate duration of the assignment for the fiscal year 1965/66, with a possibility for extension):

Aden: Marine Biologist (18), Turtle Biologist (6).

Argentina: Marine Biologist (18), Oceanographer (18), 2 Master Fishermen (18), Acoustics Expert (12), Fisheries Economist (18).

Caribbean: Fish Marketing Expert (18), Fish Training Expert (15), 2 Master Fishermen (18).

Colombia: Fishery Development Adviser (6).

Central America: Fisheries Economist (18), Fishing Expert (15), Fish Processing Expert (12).

Cuba: Master Fisherman (9), Fishery Development Adviser (18).

Cyprus: Fisheries Director (18).

East Pakistan: Fisheries Biologist (18), Oceanographer (12), 2 Master Fishermen (18), Training Officer (18), Fish Processing Expert (12), Marketing Expert (18), Statistician (18).

Ghana: Marine Biologist (18), Fishery Training Expert (12).

India: Fishing Gear Expert (15), Fish Processing Technologist (12), Fish Processing Technologist (6), Reservoir Fishing Expert (9), River Pollution Expert (6).

Iran: Inland Fisheries Expert (6).

Lake Kariba (Rhodesia): Fishery Technologist (18).

Nigeria: Fisheries Officer (18), Master Fisherman (15), River Fisheries Biologist (15), Marine Fisheries Biologist (17).

Philippines: Fish Marketing Expert (18), Fish Processing Expert (18). Senegal: Fishing Gear Expert (9). Syria: Marine Fisheries Expert (3). Togo: Fisheries Adviser (18). Venezuela: Marine Fisheries Expert (6). Zambia: Inland Fisheries Biologist (12).





## HIGHLIGHTS IN THIS ISSUE (SEPTEMBER 1965)



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**Tuna--Skipjack biological studies in Central Pacific** continued (p. 20).

**Trout--Great Lakes population increases through U. S.-Canadian cooperation** (pp. 51 & 58).



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**WHALING:** Global regulations urged (p. 52).

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**U.S.S.R.--**plans big increase in fishing fleet and catch (p. 77).

**UNITED KINGDOM--**how to maintain fish quality on vessels at sea (p. 78); radiation-preservation of frozen fish (p. 79); 1965 World Fishing Exhibition (p. 79).

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Fishes

# COMMERCIAL FISHERIES REVIEW

## RADIATION PRESERVATION OF SEAFOOD

U.S. DEPARTMENT OF THE INTERIOR

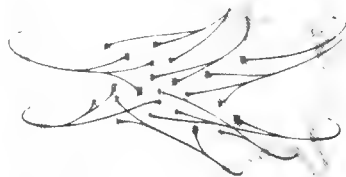
BUREAU OF COMMERCIAL FISHERIES



FRESH SEAFOOD ON ICE  
WILL KEEP ABOUT 14 DAYS

**IRRADIATION**  
WILL DOUBLE THIS  
KEEPING TIME AND  
INCREASE  
FRESH FISH SALES

HIGH QUALITY  
FRESH FISH  
WILL REACH

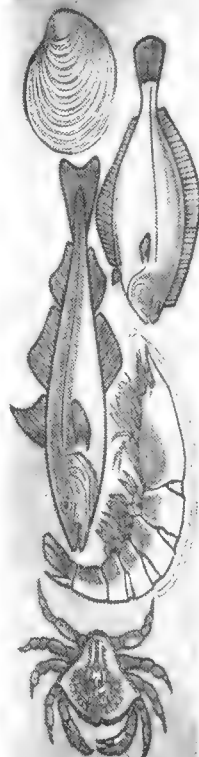


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MARKETS FOR FRESH FISH BY

- selecting suitable species
- determining optimum radiation levels
- establishing maximum storage time  
at different storage temperatures
- providing for FDA wholesomeness  
clearance
- testing and selecting packaging  
materials
- conducting economic feasibility  
analysis



VOL. 27, NO. 10

OCTOBER 1965

**UNITED STATES DEPARTMENT OF THE INTERIOR**  
*Fish and Wildlife Service*  
**Bureau of Commercial Fisheries**  
*Washington, D.C.*





# COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries  
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor  
G. A. Albano and H. Beasley, Assistant Editors

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5/31/68

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# COMMERCIAL FISHERIES REVIEW

October 1965

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## PASTEURIZATION OF FISHERY PRODUCTS WITH GAMMA RAYS FROM A COBALT-60 SOURCE

By Louis J. Ronsivalli\* and J. W. Slavin\*\*

### ABSTRACT

This paper describes research on radiation-pasteurization of fresh fish so as to extend its shelf life. The U.S. Bureau of Commercial Fisheries Technological Laboratory in Gloucester, Mass., conducted the research under a contract from the U.S. Atomic Energy Commission.

The results indicate that a number of economically important North Atlantic fishery products can be held refrigerated in an acceptable condition for at least one month after treatment with low doses of gamma radiation without significant nutritive losses. The method is practical even when 50 percent of the shelf life has been used up.

An investigation of the chemistry of fish flavors and odors has not, thus far, uncovered any evidence that irradiation causes the formation of aberrant or unusual compounds.

Packaging studies showed that many commercially available plastic materials are suitable for packaging radiopasteurized fishery products and that in most cases unsuitability was apparently due to high gas permeability rates and poor sealing characteristics.

Total plate counts conducted before and after irradiation with 250,000 rads indicated that the bacterial flora in haddock fillets was reduced by approximately 99 percent.

### SUMMARY

Research on radiation-pasteurization of fresh fish to extend its refrigerated shelf life was conducted by the U. S. Bureau of Commercial Fisheries Technological Laboratory at Gloucester, Mass., under a contract from the U. S. Atomic Energy Commission.

The results thus far indicate that clam meats and haddock, cod, pollock, and ocean perch fillets can be held refrigerated in an acceptable condition for at least one month after treatment with low doses of gamma radiation (150-450 kilorads).

The effect of irradiation on amino acids and B-vitamins was relatively insignificant and certainly not greater than the effects of cooking or of seasonal variations.

Suitable techniques for studying volatile carbonyl and sulfide compounds in clam meats and fish fillets have been developed and changes in the concentrations of carbonyls and sulfides, caused by irradiation, storage, and cooking, have been determined. At least 20 aldehydes, ketones, and sulfides have been identified in the volatiles of clam meats.

Data have been obtained to show that radiation-pasteurization of haddock fillets has practical application even when the fillets have been stored in ice for more than half their normal shelf life prior to irradiation.

Experiments to determine the suitability of available plastic films or wrappings as packaging materials for irradiated fishery products showed that films having a relatively low oxy-

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Note: This work was supported by the Division of Biology and Medicine and the Division of Isotopes Development, U.S. Atomic Energy Commission, under Contract Nos. AT(49-7)-2443 and AT(49-11)-1889.

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Sep. No. 742



Fig. 1 - Model of Marine Products Development Irradiator.

gen permeability are suitable and those having a relatively high oxygen permeability are unsuitable. The films tested (polyethylene, polypropylene, polyester, nylon-11, and others) were found to be resistant to bacterial penetration. They were also relatively free from pinholes and their seams were adequately strong.

It was found that the bacterial numbers in fresh haddock fillets were reduced by at least 99 percent by irradiation with 250,000 rads.

### BACKGROUND

The value of fishery products as a source of protein is well known and since man's dependence on them is anticipated to increase, it is inevitable that he apply his latest technology to the sea. In general, fishery products are relatively perishable and consequently distribution of fresh fish and shellfish is limited to coastal areas. Wider distribution is possible when those products are either heat-processed or frozen; however, in most cases, fresh fish and shellfish, like fresh fruits and vegetables, command a higher consumer preference and a higher selling price than their frozen counterparts.

Since the discovery that ionizing radiations can be used to preserve food, much work has been done, especially in recent years, on the use of this energy for sterilization of many foods including fish and shellfish. The application of high levels of energy to those products resulted in significant quality loss from irradiation-induced flavors and odors. However, early

research indicated that the refrigerated storage life of fishery products could be significantly extended without objectionable quality changes when irradiated with pasteurizing doses of ionizing radiations (less than one megarad).

This paper reports on the results of research at the Bureau of Commercial Fisheries Technological Laboratory in Gloucester, Mass., on pasteurization of fishery products with gamma rays from cobalt-60. Objectives were to determine:

- (1) The commercial species of Atlantic fish and shellfish to which radiation-pasteurization is suitable.
- (2) The optimum level of radiation for each species. The optimum level might be defined as that dose which permits a significant extension in the refrigerated shelf life of the product without causing objectionable alterations in product quality. A marketing survey conducted in 1960 indicated that if fish and shellfish could retain their fresh quality for 3 to 4 weeks, their distribution could be extended to all points in the United States. Hopefully, this would result in increased per capita consumption of fishery products, especially fresh fish.
- (3) The effect on quality of irradiating the products in aerobic (oxygen) and anaerobic (non-oxygen) environments.
- (4) The effect on shelf life of storage at near-freezing temperature (32°-35° F.) and at the temperature of domestic refrigerators (about 42° F.).
- (5) The effects of irradiation, cooking, and extended storage on the concentration of free and total amino acids and B-vitamins.
- (6) Changes in composition of compounds as a result of irradiation and extended storage.
- (7) The suitability of available flexible packaging materials as containers for irradiated fishery products.
- (8) The effect of pre-irradiation quality of fish on post-irradiation shelf life.

#### THE RESEARCH PROGRAM

OPTIMUM DOSE AND ACCEPTANCE STUDIES: The work schedule to determine the process feasibility and optimum dose levels was designed to permit investigations at the rate of two species a year. Haddock fillets (Melanogrammus aeglefinus) and soft-shell clam meats (Mya arenaria) were studied first.

Experiments were conducted to determine:

- (1) The optimum dose for air- and vacuum-packed products.
- (2) Their storage life at 33° F. and at 42° F.
- (3) Their level of acceptability during storage after irradiation at the optimum dose.

To determine optimum doses, the samples were packed in cans in air or under vacuum, irradiated at different doses and stored at 33° F. and at 42° F. Periodically the organoleptic quality of the samples was compared with that of fresh or fresh frozen samples. At the end of each experiment, the average organoleptic score of the samples from each of several dose levels was compared with the average score of the control samples. That dose that permitted the product to be held for 30 days and that resulted in scores least different from the con-

trol samples was considered to be the optimum dose. Student's t-test was applied to determine the degree to which the irradiated products differed from the controls.

To determine acceptability, samples were air-packed (when the optimum dose studies did not indicate a necessity for vacuum-packing), irradiated at the optimum dose, stored at 33° F., and periodically examined organoleptically by the single stimulus method using a nine-point hedonic scale.

Table 1 - Optimum Radiation Levels for Some Fishery Products

Product	Air-Packed in Cans	Vacuum-Packed in Cans
	Rads	Rads
Haddock fillets . . . .	250,000	150,000
Clam meats . . . . .	450,000	350,000
Pollock fillets . . . .	150,000	150,000
Ocean perch fillets . .	250,000	150,000
Cod fillets . . . . .	150,000	-

Details of the procedures used have been published by Connors et al (1964).

Species investigated to date are haddock, soft-shell clams, pollock (*Pollachius virens*), ocean perch (*Sebastes marinus*), and cod (*Gadus morhua*). The optimum dose data for those species are shown in table 1.

To determine acceptability, haddock fillets and clam meats were taste-tested by trained and untrained sensory panels. The results are shown in tables 2 and 3.

The results to date show that radiation with cobalt-60 gamma rays significantly extends the refrigerated storage life of haddock, pollock, ocean perch, and cod fillets and clam meats without creating objectionable changes in the organoleptic quality of the product.

The data in table 1 indicate that air-packed samples generally required a higher irradiation dose than did the vacuum-packed samples. This is probably explainable on the basis that the organism mainly responsible for spoilage requires an aerobic environment.

Table 2 - Average Organoleptic Scores Assigned to Irradiated Deep-Fat-Fired Haddock Fillets by Different Taste Panels

Panel	No. in Panel	Storage Time at 33° F. Prior to Testing	Average 1/ Organoleptic Score of Treated Samples	Average 1/ Organoleptic Score of Control Samples
		Days		
Gloucester	12	15	8.0	2/
Mixed	45	15	8.4	2/
U.S. Army	19	60	7.5	8.0
U.S. Army	300	15	5.5	6.5
U.S. Army	300	30	5.6	6.1

1/A 9-point hedonic scale was used where: 9 - like extremely, 8 - like very much, 7 - like moderately, 6 - like slightly, 5 - neither like nor dislike, 4 - dislike slightly, 3 - dislike moderately, 2 - dislike very much, 1 - dislike extremely.

2/No controls were used in these tests, but previous experience indicates that controls would have received scores between 8 and 9.

Table 3 - Average Organoleptic Scores Assigned to Irradiated Deep-Fat-Fired Soft-Shell Clam Meats by Different Taste Panels

Panel	No. in Panel	Storage Time at 33° F. Prior to Testing	Average 1/ Organoleptic Score of Treated Samples
		Days	
Gloucester	12	15	7.8
Gloucester	12	30	7.7
Mixed	45	15	8.6
M.I.T.	?	15	6.0
M.I.T.	?	30	5.1

1/A 9-point hedonic scale was used where: 9 - like extremely, 8 - like very much, 7 - like moderately, 6 - like slightly, 5 - neither like nor dislike, 4 - dislike slightly, 3 - dislike moderately, 2 - dislike very much, 1 - dislike extremely.

The organoleptic test results show that the taste panel did not detect statistically significant quality differences between air-packed and vacuum-packed samples. However, comments by individuals gave evidence that air-packed clam meats were more tender than the vacuum-packed samples. With ocean perch fillets there were comments of rancidity in some air-packed samples, but this was not severe enough to be objectionable.

#### AMINO ACID AND B-VITAMIN STUDIES:

Haddock fillets and soft-shell clam meats were analyzed for total and free amino acids

and for B-vitamins to determine the effects of radiation, cooking, and storage on those nutrients.

Analyses were made on unirradiated fresh samples, samples irradiated at their optimum dose level, samples irradiated at ten times their optimum dose level, stored samples, heat-processed samples, and samples which received a combination of treatments. The procedures used for the quantitative analyses and the results are reported by Brooke et al (1964).

Irradiation at the optimum dose levels did not significantly affect the amino acid and vitamin-B values of haddock fillets and clam meats. There was some loss of thiamine. But even when the samples were irradiated at a level ten times greater than the optimum dose, the nutrients were not affected to any greater degree than can be expected as a result of cooking or seasonal variations.

**FLAVOR AND ODOR STUDIES:** Because fishery products spoil relatively quickly and because quality deterioration is detectable in volatile components (as evidenced by bad odors and flavors), a project was started to study the volatile compounds in fish and shellfish.

Samples were diced and the volatile compounds were removed under high vacuum and condensed in a liquid nitrogen-cooled trap. The condensate was then heated and the vapors were made to flow into a transfer chamber of measured volume which was then connected to a gas chromatograph to permit analysis of the volatiles. Two gas chromatographs were available for this work. The instrument used for the early work was fitted with a Strontium-90 ionization detector. The retention column is fitted with a temperature programmer. The column temperature can be automatically increased from the temperature of dry ice ( $\sim -79^{\circ}\text{C}.$ ) to about  $70^{\circ}\text{C}.$  at a predetermined rate. The other gas chromatograph is equipped with a hydrogen flame detector and the retention column temperature can be automatically programmed from room temperature to  $500^{\circ}\text{C}.$

Several retention columns were used, all with the same solid support--acid washed Chromosorb-W. The liquid phase or column coatings used were:

- (1) 2, 5, or 10% oxydipropionitrile.
- (2) 15 or 25% Carbowax 20M.
- (3) 5% butanediol succinate.
- (4) 20% ethylene glycol succinate.

Chromatograms resulting from the analyses were studied to note which compounds reflected effects of irradiation, heat-processing, storage, or a combination of treatments (see figure 1 for a typical chromatogram).

In addition to studying total volatiles, classes of compounds were studied separately. Carbonyl compounds were analyzed by two methods:

- (1) A modification of the Girard-T reagent method, described by Gaddis et al (1964) which permitted gas chromatography of isolated carbonyl compounds, was used to separate and identify individual carbonyls.
- (2) Total carbonyl compounds were determined by the 2,4-dinitrophenylhydrazine precipitation method described by Mendelsohn and Steinberg (1962).

Although more work needs to be done, enough evidence has been obtained to show that the volatile carbonyl compounds in clam meats may be useful indicators of quality and/or treatment of the product. Figure 1 represents a typical gas chromatogram of the concentrated volatile carbonyls in fresh raw clam meats. It is believed that this type of chromatogram can be used as a standard for identifying fresh clams, but more data are required before this can be established. The compounds have been identified by comparing their retention times with those of pure compounds on three separate columns. Similar chromatograms were obtained for the volatiles of cooked fresh clam meats, fresh raw irradiated clam meats, and nine-day-old raw clam meats. When the chromatograms were compared, it was found that irradiation at 350,000 rads and storage for 9 days affected carbonyl concentrations similarly.

Both variables caused large increases in peaks 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 15 and 16; a slight increase in peak 14; and no peaks were lost. By large increases, it is meant the peak areas were increased by a factor of five or more, and slight increases by a factor of two or less. Irradiation caused the appearance of 2 (possibly as much as 4) new small peaks.

Cooking caused a large increase in peaks 1, 2, 6, 11, 12, 13, and 15; moderate increases in 14 and 15; large decreases in 3, 4, and 7; a slight decrease in 9; and peak 5 was lost.

It is possible that carbonyl compounds may exist in quantities too small to detect which may account for the apparent appearance and disappearance of peaks in the chromatograms when the volume of a compound passes beyond the threshold of detectability.

The determinations of total carbonyls are presently being continued as a secondary quantitative method. It has value as a check on the results obtained with the gas chromatographic method.

Results in recent experiments indicate that the detectable volatile carbonyls disappear as the time of storage increases beyond 30 days, and that irradiation reduces the times required for carbonyls to reach their maximum concentration and their ultimate loss.

Sulfide compounds were studied by two separate methods:

- (1) A colorimetric method (1955) involving the production of methylene blue.
- (2) Sulfides were also studied using a modification of the Bassette method (1962). Gas chromatographic analyses for sulfides permitted identification of the individual compounds by comparing their retention times with retention times of known sulfides.

Briefly, the Bassette method involves separating a sample into two parts. One part is reacted with mercuric chloride which removes the sulfides from the sample mixture. When the two aliquots are individually chromatographed, the sulfide compounds in the unreacted aliquot can be determined by noting which of the peaks are missing in the chromatogram of the reacted sample.

Tentative identification of the unknown sulfides was made by the method of Baumann and Olund (1962) which related relative retention times of the compounds to their molecular weights.

The details of these experiments will appear in a series of papers which are presently being prepared for publication by staff members of the Gloucester Technological Laboratory.

Employing the quantitative methylene blue method, it was found that total sulfides in clam meats increase with storage. The irradiated samples did not show as rapid an increase in sulfides as did the unirradiated samples. Besides permitting one to follow the overall changes in total sulfides, this method also has value as a check on the results obtained by the gas chromatographic method. However, the method does not permit identification of the individual compounds.

Using the modified bassette gas chromatographic technique, five compounds have been tentatively identified. They are hydrogen sulfide, dimethyl sulfide, dimethyl disulfide, methyl mercaptan, and ethyl isopropyl sulfide.

PRE- AND POST-IRRADIATION STUDIES: Although it was necessary to use extremely fresh fish for the optimum dose determination studies, it was recognized that in commercial practice the radiation process would have to be applicable to fish one week or more out of the water. A project was undertaken to show the effects of the pre-irradiation quality of the product on its post-irradiation quality and shelf life.



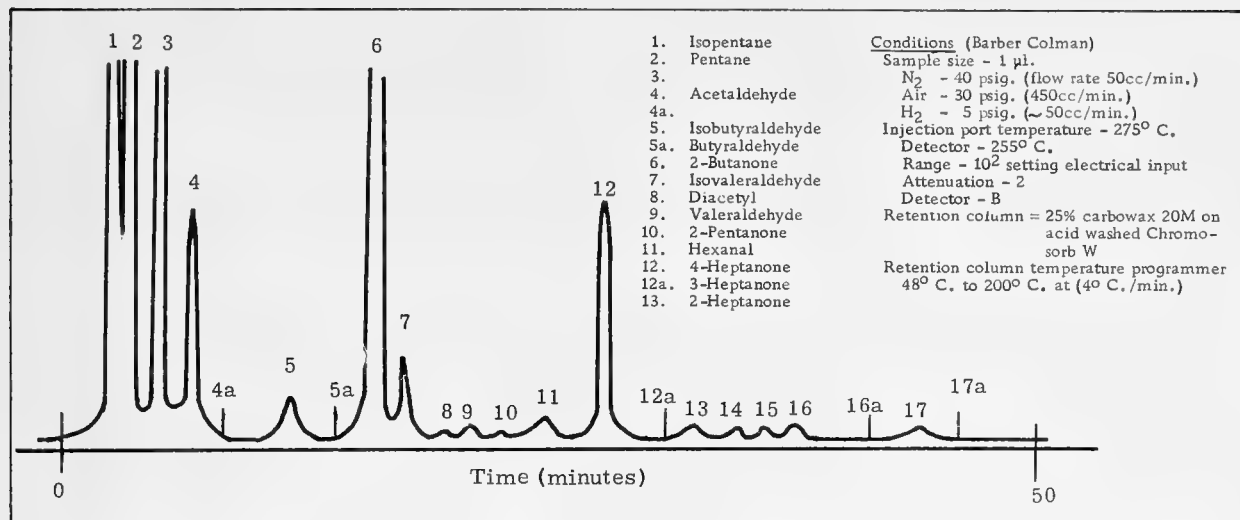


Fig. 2 - Gas chromatogram of concentrated volatile carbonyl compounds in raw, unirradiated clam meats held for two days at 34° F.

Table 4 - The Post-Irradiation Shelf Life at 34° F. of Air-Packed Skinless Fillets Cut from Haddock Iced for Different Periods Prior to Irradiation

Pre-Irradiation Iced Storage Days	Maximum Post-Irradiation Shelf Life			
	1st Exp.	2nd Exp.	3rd Exp.	Avg.
4	26	33	33	31
7	16	32	35	29
9	13	27	30	23
11	10	10	16	12
16 (spoiled)				

The very freshest haddock and haddock fillets(haddock was the first species studied) were brought into the laboratory and the fillets were immediately plate frozen at -40° F. and stored at -5° F. The fish were iced in large wooden boxes to simulate shipboard holding conditions. Periodically, some fish were withdrawn and filleted, and the fillets were canned and irradiated at the optimum dose and stored at 34° F. The fillets were organoleptically tested periodically until the onset of spoilage.

In the last haddock experiment, the samples were also analyzed for total plate counts.

The results of those experiments are shown in table 4 and figure 2.

The curve in figure 2 represents the averages of the data obtained in three separate experiments which are shown in table 4. From the curve it can be seen that when fish are held in ice for not longer than about nine days, a considerable post-irradiation shelf life can still be expected. However, as the pre-irradiation time is increased beyond nine days the post-irradiation shelf life is sharply reduced.

The difference in maximum post-irradiation values obtained in the three experiments shown in table 4 reflect differences in the original quality of the fish in each batch.

**PACKAGING STUDIES:** Because of the many advantages offered by flexible packaging materials, a study was initiated to determine the suitability of the available plastics to hold irradiated fish and shellfish.

Several films were chosen for study according to desirable properties as shown in table 7.

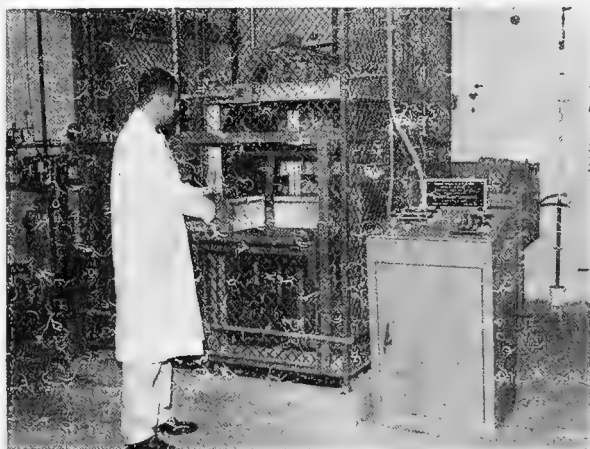


Fig. 3 - Loading 30-pound fillet tins on fast conveyor. Product will be transported through maze into the radiation cell for pasteurization.

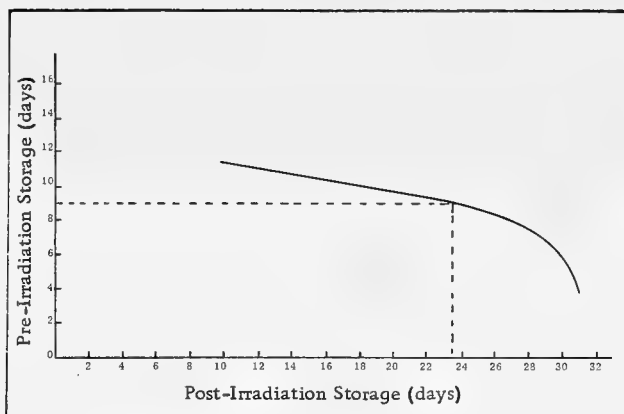


Fig. 4 - Relationship between pre-irradiation time of eviscerated haddock stored in ice and the maximum post-irradiation shelf life of the fillets (average of three experiments).

mil) polyolefin mixture, (1.6 mil) nylon-11, (1 mil) nylon-6, (.2/1.6 mil) saran-coated nylon-11, and (2 mil) polyolefin-coated polyester. A publication covering that work is presently being prepared.

All of the films tested were found to be impermeable to bacterial penetration under the conditions to which they were exposed. There is no recognized method for determining bacterial permeability of plastic materials; in fact, there is practically no published work available on the subject. The original method used for this work is being developed further and will be published as a suitable and reliable technique for determining the bacterial permeability of plastic packaging materials.

The films were found to be relatively free from pinholes and of sufficient seal strength.

Results of early experiments showed that the polyethylene, polypropylene, and the mixed polyolefin films did not protect the quality of the product for periods longer than two to three weeks. The results of later experiments with nylon-11 and polyester are shown in table 5, and the organoleptic data clearly indicate that those films were as suitable as the can for a period of four weeks. However, it will be noted that the bacterial numbers were lower in the canned product. It is expected that if the products were held for a longer period, the higher total plate counts in the plastic-packaged samples would be reflected in significantly lower organoleptic scores.

The data appear to support the idea that the quality loss in the stored product is a function of the oxygen permeability of the material in which it is contained. This is particularly true for pasteurized products with a surviving flora which has at least a partial dependence on oxygen.

Sample No.	Total Plate Counts/g Prior to Irradiation	Total Plate Counts/g After Irradiation	Percentage Reduction in Total Plate Count
1	83,000	450	99.5
2	170,000	200	99.9
3	180,000	450	99.7
4	100,000	990	99.0
5	100,000	1,200	99.0
6	1,300,000	2,200	99.8
7	5,500	50	99.1

Note: Values are averages of duplicates.

mine the reduction in bacteria as a result of the process and some of the data obtained are shown in table 6.

The films were examined for their resistance to bacterial penetration. Details of the test used to determine bacterial resistance of packaging films are described in a paper being prepared for publication. The films were also tested for seal strength and presence of pinholes.

For each experiment to determine the suitability of packaging materials, haddock fillets were packed in cans and in plastic pouches of different materials, irradiated, stored at 33° F., and periodically taste-tested. Total plate counts were determined concurrently. The organoleptic quality of the plastic-packaged samples was compared with that of the canned samples (table 5). The films tested thus far are (4 mil) polyethylene, (1 mil) polypropylene, (1.5 mil) oxygen permeable cellophane, (3.5)

Packaging Material	Average Organoleptic Scores <sup>1/</sup>			Total Plate Counts/g (x10 <sup>6</sup> )		
	Experiment No.			Experiment No.		
	1	2	3	1	2	3
Nylon-11	2.0	2.2	2.3	94.0	1.6	12.0
Saran-coated Nylon-11	2.0	2.1	2.7	1.1	61.0	17.0
Polyolefin-coated polyester	2.2	2.0	2.2	17.0	18.0	3.0
Metal can	2.1	2.4	2.3	1.9	24.0	2.8

<sup>1/</sup>A 5-point scale was used where: 5 - excellent, 4 - very good, 3 - good, 2 - fair, 1 - poor.

**MICROBIOLOGY:** Routinely, whenever a batch of fish was brought into the laboratory at the start of a storage study, initial total plate counts were made. Total plate counts were also made after irradiation to deter-

Table 7 - List of Required Properties for Packaging Materials to be Used as Containers for Irradiated Fish and Shellfish

1. Must be approved by the F.D.A.
2. Must be easily sealed, preferably by ordinary heat-sealing methods.
3. Must prevent water loss.
4. Must be strong enough to withstand moderate handling conditions.
5. Must have a life expectancy of at least two months at 32° F. (The shelf life expectancy of the product at 33° F. is 1-2 months.)
6. Must maintain integrity when exposed to irradiation doses of up to 500,000 rads.
7. Must not impart off-odors or off-flavors to the product.
8. Must prevent microbial contamination of the product.

Standard methods were used in sampling, plating, and colony counting. The agar was a modified Eugon agar and its composition is shown in table 8.

Plates were incubated for five days at 20° C. and the colonies were counted using a Quebec colony counter.

The method of Solberg and Proctor (1960) was used for distinguishing small colonies.

Table 6 lists some of the total plate count data obtained from haddock fillet samples, and for that species a radiation dose of 250,000 rads apparently reduced the bacterial numbers by at least 99 percent.

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Created in 1849, the Department of the Interior--a department of conservation--is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States--now and in the future.

Table 8 - Formula of Agar

	g/l
BBL trypticase . . . . .	15.0
Phytone . . . . .	5.0
Sodium chloride . . . . .	4.0
Sodium sulphite . . . . .	0.2
L. cystine . . . . .	0.7
Dextrose . . . . .	5.5
Bacto yeast agar . . . . .	5.0
Agar . . . . .	15.0

Final pH 7.0 ± 0.1.

Sterilized in autoclave @ 118° C. for 15 minutes.

Note: This formula was developed by Professor J.T.R. Nickerson of M.I.T.

## CONSTRUCTION AND OPERATION OF THE "COBB" PELAGIC TRAWL (1964)

By Richard L. McNeely,\* Leonard J. Johnson,\*\* and Charles D. Gill\*\*\*

### SUMMARY

1. The "Cobb" pelagic trawl has caught large quantities of Pacific hake while being towed through the water at a speed of only 2 to 3 knots.
2. The quadruple armored, six-conductor towing cable has withstood repeated tows under test fishing conditions.
3. Accurate depth positioning of the trawl was essential for making repeated large catches of midwater fish.
4. Trawl depth was easily controlled by changing engine speed.
5. The "Cobb" pelagic trawl was effectively operated by a 73-foot Pacific Coast commercial trawler.

### INTRODUCTION

During 1964, substantial catches of Pacific hake (*Merluccius productus*), Pacific ocean perch (*Sebastes alutus*), and anchovy (*Engraulis mordax*) were made by the U. S. Bureau of Commercial Fisheries' 93-foot research vessel John N. Cobb and the chartered 73-foot commercial trawler St. Michael using experimental "Cobb" pelagic trawls (fig. 1). Catches up to 30 tons of mostly Pacific hake have been made in a single 30-minute tow (figs. 11, 12 and 13).

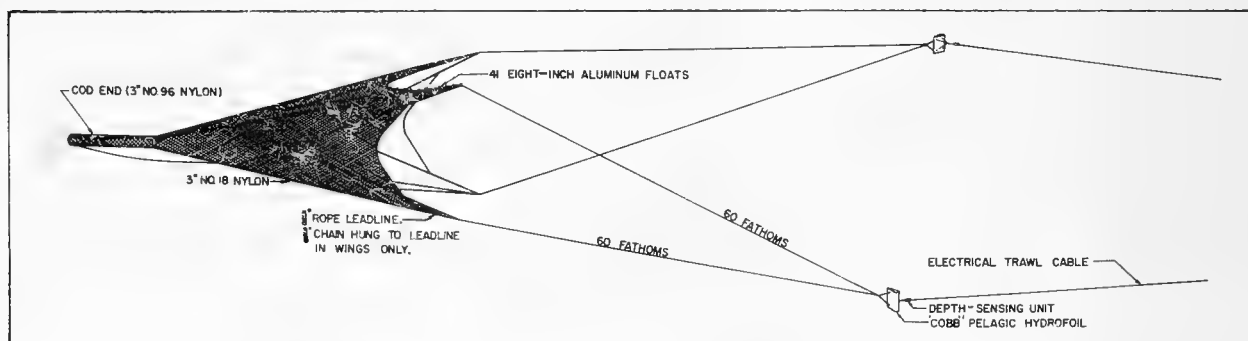


Fig. 1 - "Cobb" pelagic trawl (1964).

The "Cobb" pelagic trawl has been under development since 1961 at the Bureau's Exploratory Fishing and Gear Research Base in Seattle, Wash. (Alverson 1962). The details of construction have primarily resulted from modifications shown to be necessary during direct underwater observation by SCUBA-equipped scientists traveling along with the gear (McNeely 1963). Excellent catches taken during the past year show that a large net towed at 2 to 3 knots would be effective in harvesting midwater species.

Consistently good catches of hake by the St. Michael during gear research experiments and by the John N. Cobb during pelagic explorations have resulted in an unusually large number of requests for information concerning details of construction and operation of the new gear. This report will satisfy such requests.

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U. S. DEPARTMENT OF THE INTERIOR  
Fish and Wildlife Service  
Sep. No. 743

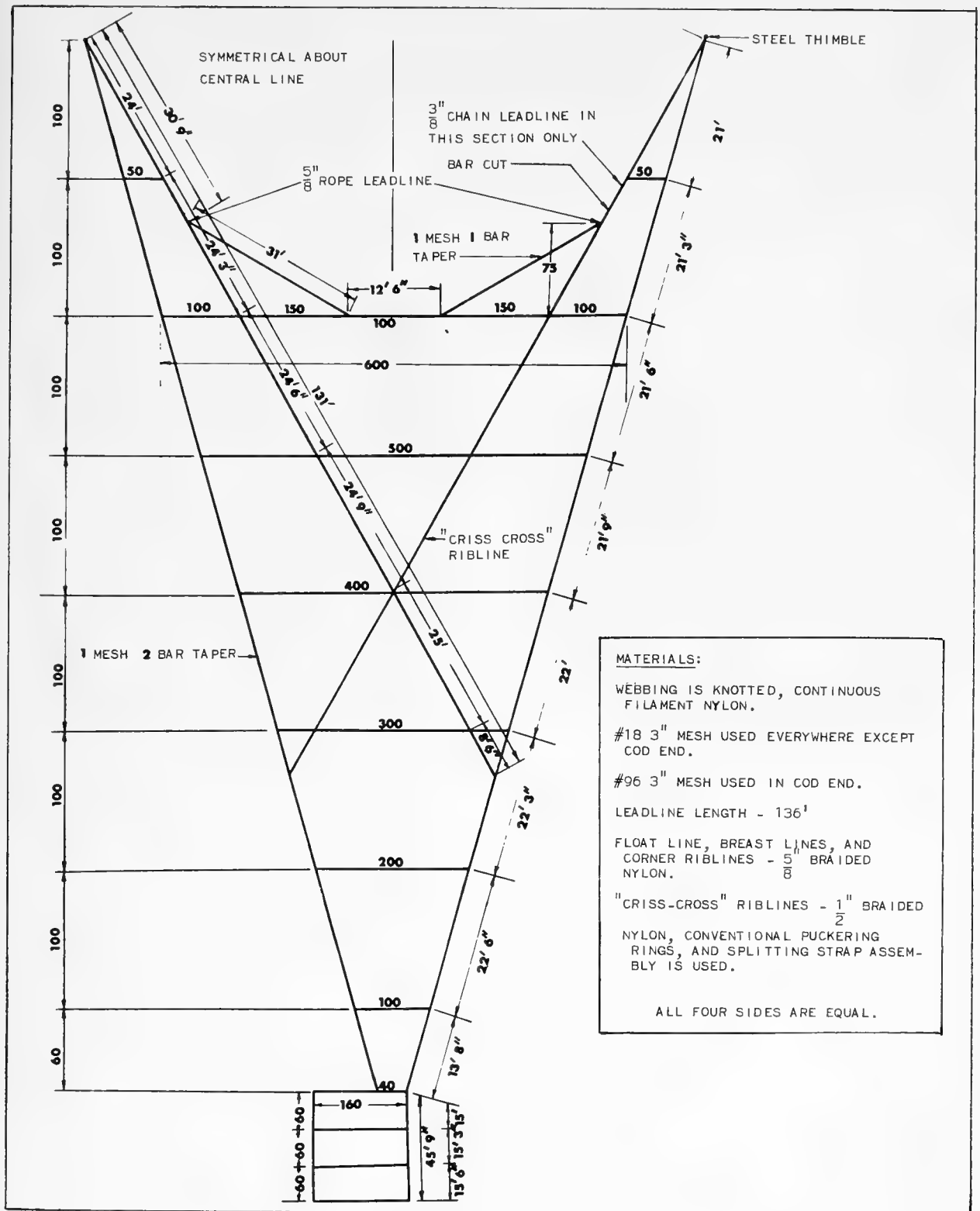


Fig. 2 - Construction details of the "Cobb" pelagic trawl.

## DESCRIPTION OF EQUIPMENT

**"COBB" PELAGIC TRAWL (1964):** The "Cobb" pelagic trawl is a large, tapered net with an approximate mouth opening of 60 feet by 60 feet and a length of 215 feet. The trawl is similar in many respects to midwater trawls used in two-boat commercial fishing operations in northern Europe and experimental one-boat trawls used by fishery scientists in many parts of the world (Parrish 1959).

Details of the "Cobb" pelagic trawl net are shown in figure 2. Webbing in the body and wings has 3-inch mesh (stretched opening, including one knot) of No. 18 conventional knotted nylon webbing. Corner riblines, breastlines, and headrope are constructed of  $\frac{5}{8}$ -inch diameter braided nylon rope while "criss-cross" riblines are constructed of  $\frac{1}{2}$ -inch diameter nylon rope. The center section of the footrope is made of conventional, medium lay nylon rope. Galvanized chain of  $\frac{3}{8}$ -inch is used as a leadline in the outer sections of the footrope, reducing sag in the center section and resultant loss of horizontal spread. Concentration of weight in outer section also minimizes the amount of footrope on bottom when the net touches the bottom. Normally 41 standard 8-inch trawl floats are spaced about 3 feet apart along the headrope.

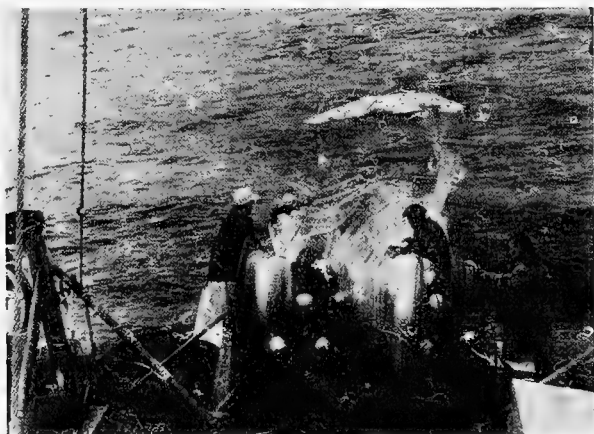


Fig. 3 - Incremental hang-in along corner riblines is illustrated in photograph of the "Cobb" pelagic trawl being reeled aboard the St. Michael. This catch is approximately 42,000 pounds of Pacific hake taken in a 60-minute tow. The same catch is also shown alongside vessel in fig. 12.

line hang-in (fig. 3). To compensate for greater stretch under load of the riblines in the forward sections of the net, percentage of hang-in is reduced gradually from 16 percent at the wing tips to 10 percent at the cod-end junction and further reduced to 0 percent in the last 60 meshes of the cod end. Underwater observations show that when hung-in at these rates, all meshes in the net open to about 60-degree diamond shapes, thus indicating that the load is distributed satisfactorily.

**OTTER BOARD AND RIGGING: Hydrofoil Otter Boards:** "Cobb" pelagic otter boards (figs. 4 and 5) are constructed mainly of high-strength, corrosion-resistant aluminum. The shoe is made of  $\frac{1}{2}$ -inch thick steel plate. The upper three chambers of each airplane wing-shaped otter board contain five 8-inch diameter and eight 5-inch diameter aluminum trawl floats. The floats keep the door upright in the water.

Upper and lower forward bridle chains are 25 links each of  $\frac{3}{8}$ -inch case-hardened steel. Upper and lower rear bridle chains are 41 links each. Upper and lower trace chains are each 86 links long. These lengths of bridle chains provide maximum horizontal spreading power in a neutral attitude. Changes from neutral attitude are easily affected by removal of a few links from either upper or lower trace chains depending on the diving or climbing attitude desired. Any change from neutral attitude causes a loss of horizontal spreading power.

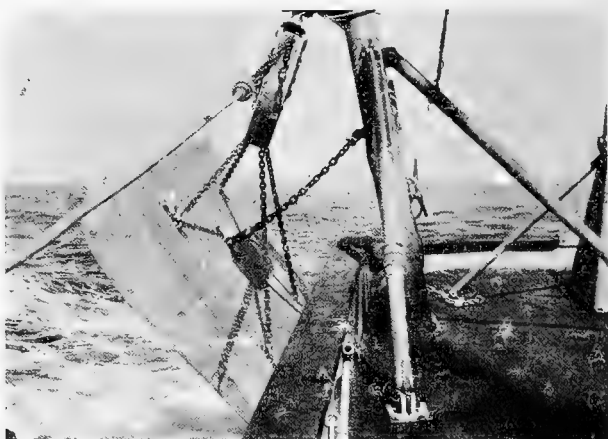


Fig. 4 - Airplane wing-shaped aluminum otter boards are used to open experimental "Cobb" pelagic trawl. Also note depth-sensing unit at termination of electrical towing cable.



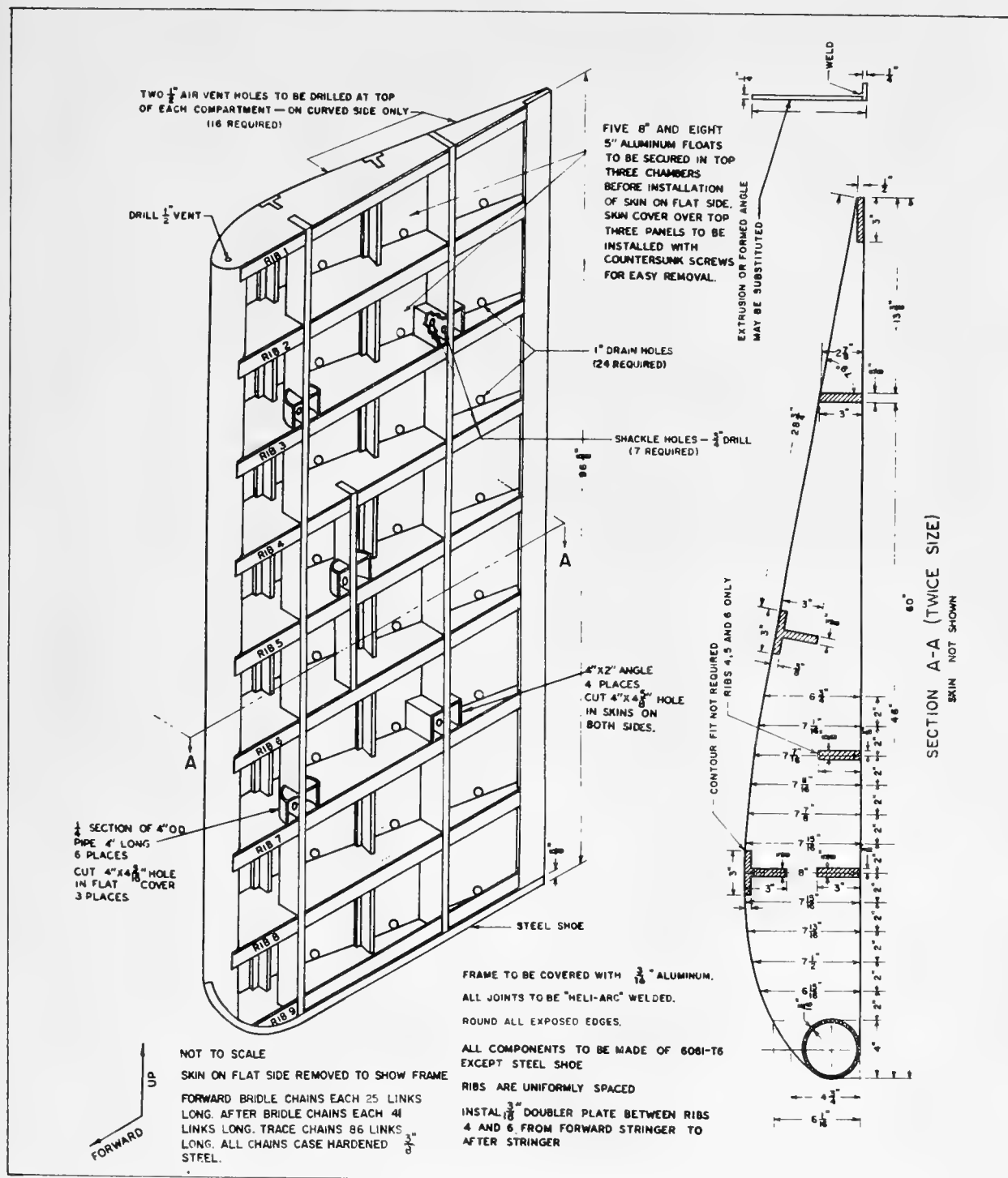


Fig. 5 - Construction details of the "Cobb" pelagic otter board (starboard side shown).

Sweep-lines: A conventional bridle system connects the net to the hydrofoils. Bridle sweep-lines are 60 fathoms long and are made of  $\frac{1}{2}$ -inch diameter steel cable.

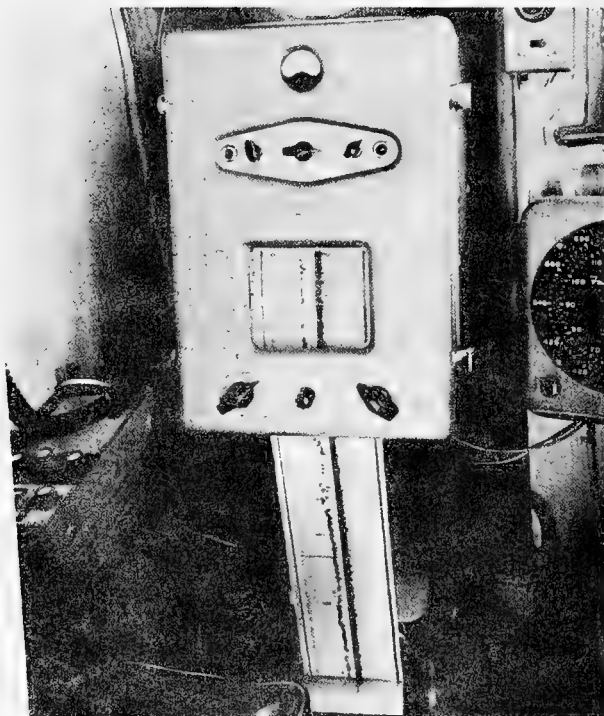


Fig. 6 - Echogram of fish concentration shows 4- to 6-fathom thick layer approximately 10 fathoms off bottom in 62-fathom water depth. Drag made while this echogram was being recorded yielded 50,000 pounds of mostly Pacific hake.

layer opposed helical-wound steel armor (fig. 8). The new cables performed without fault during a 10-month period of use by the John N. Cobb and the St. Michael. (The cable was transferred from the John N. Cobb to the St. Michael and later reinstalled on the John N. Cobb.) Contributing factors to the satisfactory performance of the cable when compared with earlier cables (McNeely 1961) include the following:

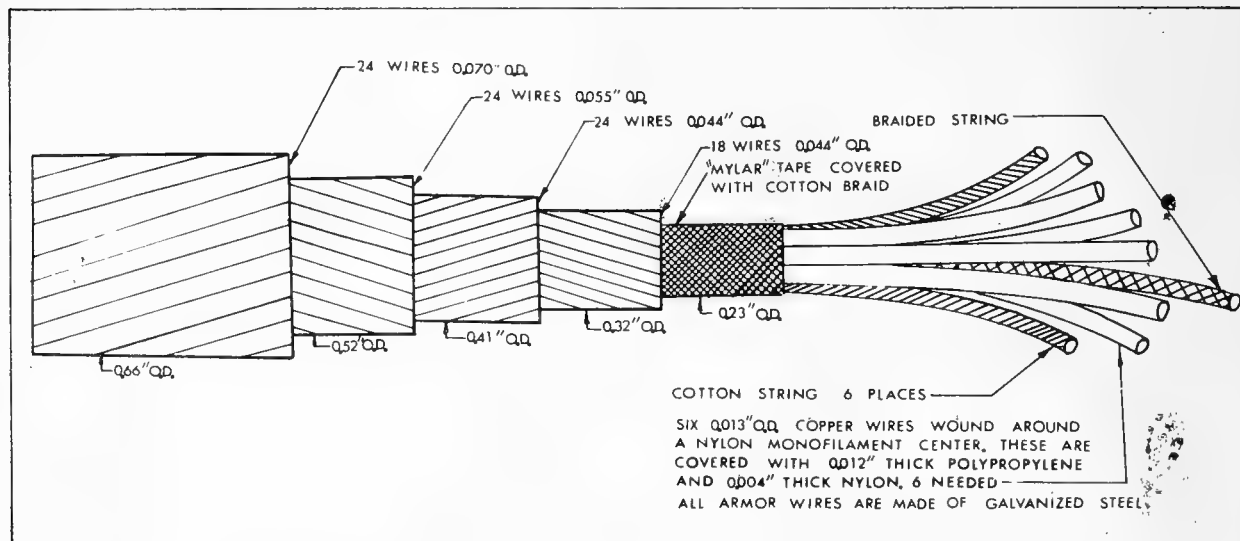


Fig. 8 - Scale drawing of the electrical towing cable shows the 4 layers of steel armor and 6 insulated conductors.

**DEPTH TELEMETRY SYSTEM:** During the 1964 sea trials of the "Cobb" pelagic trawl, an improved depth telemetry system (McNeely 1958) was used to position the trawl at the depth of fish schools located by echo-sounding (fig. 6). The telemetry system had electrical core towing cables that transmitted depth information from a precision strain-gauge sensing unit (fig. 7) located on the net or other boards to the pilothouse of the vessel.

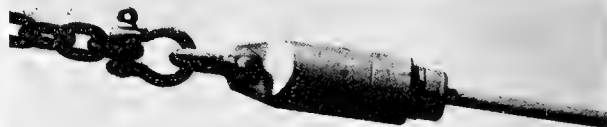


Fig. 7 - Stainless steel case on end of electrical towing cable contains precision strain-gauge type pressure transducer which serves as a depth sensor to allow accurate positioning of the midwater trawl.

A control panel in the pilothouse was connected to the winch plug-ins and a two-pen electronic strip chart recorder. The control panel contains calibrating circuits and on-off switches.

Improved electrical core towing cables used in 1964 have six conductors and four-

1. Four-layer steel armor construction.
  - a. Strain induced torque has been reduced.
  - b. The new cable has a 47,000-pound breaking strength compared to the 19,000-pound breaking strength of earlier experimental cables.
  - c. A thicker shield protects the electrical core from physical damage, particularly at the point of emergence from the sensing unit cable termination socket.
2. Electrical core construction has been improved.
  - a. Conductors are made of six twisted strands of 28-gauge copper.
  - b. Conductor insulation consists of two layers of tough plastic.
  - c. Core size has been kept to a minimum.

Termination of the electrical towing cable at the sensing unit was accomplished using either molten babbitt or epoxy to secure a short section of unwound and curled steel strands inside the termination socket (McNeely 1960). Bending and curling the four layers of steel strands to fit within the confines of the sensing unit termination socket was accomplished with little more difficulty than termination of two-layer cable. Continuity at the winch was provided by quick-disconnect, waterproof plug-ins.

#### OPERATION OF GEAR

After fish concentrations were located by the echo-sounder, the gear was set. The trawl and sweeplines were first unwound from the trawling net reel (Wathne 1959). The hydrofoil trawl boards were then hooked up, and the cable payed out from the towing winch. Cable meters attached to the towing warps were used to indicate the amount of cable unwound from each drum. Cable meters enabled the crew to let out both cables at the same rate. The trawl, sweeplines, and 100 fathoms of cable could be set in 10 minutes. After the rubber-covered plug-ins at the winch were connected, the control panel and strip chart recorder in the pilot-house were turned on. Engine speed was varied to bring the net to the desired depth.

**CONTROL OF TRAWL DEPTH:** The trawl depth was easily changed by varying engine speed. If the echo-sounder showed the depth of fish had changed while towing, the engine speed was adjusted to bring the trawl to the desired depth (fig. 9).

Even large depth changes could be accompanied by varying engine speed. In a recent test aboard the John N. Cobb, 200 fathoms of cable were unwound and the trawl towed at an engine speed of 260 r.p.m. The net was at 75 fathoms. The engine speed was then increased to 310 r.p.m. The net rose 25 fathoms in 10 minutes. The engine speed was then dropped to 210 r.p.m. causing the net to drop to 100 fathoms. This depth change took 15 minutes.

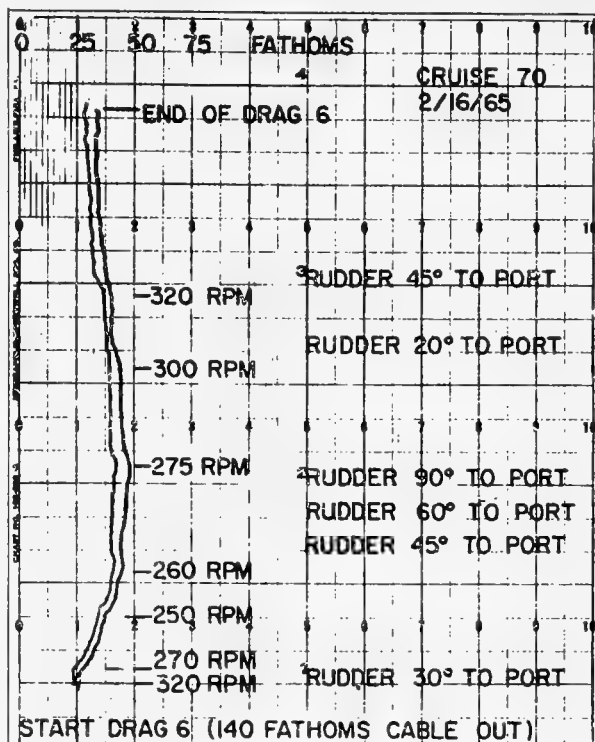


Fig. 9 - Strip-chart recording shows the depth of both starboard and port hydrofoil otter boards. The starboard hydrofoil is nearer the surface because the net banks like an airplane as the boat turns. When the turn becomes tighter the net banks more. The trawl rose in the water as engine speed was increased.

At the end of the tow, the net was hauled out. First, plug-ins at the winch were disconnected and the cable wound in. If the net was being towed near bottom, the engine was run at full speed for about 10 minutes to bring the net well clear of the bottom before reeling in cable. When the hydrofoils were brought up to the davits, idler chains were disconnected from the hydrofoils and connected to the net reel. Sweep lines and net were then wound onto the net reel. Two crewmen guided the sweep lines and net evenly onto the reel. About 40 minutes were required to wind in 150 fathoms of cable, sweep lines, and net.



Fig. 10 - Fish caught during sea trials of the "Cobb" pelagic trawl are brought aboard to determine the weight of catches (dynamometers were used to weight each "split"), to determine species composition, and to obtain biological information on hake.

### DIFFICULTIES ENCOUNTERED

Extensive testing of the trawl, hydrofoil otter boards, and depth-telemetry system revealed several deficiencies. Many fish gilled just ahead of the cod end when small fish were encountered. Webbing ripped on contact with rough bottom. Neither boat used was able to hold a course when towing across a strong tide.



Fig. 12 - A catch of 42,000 pounds of Pacific hake taken in a 60-minute tow by chartered commercial trawler St. Michael using an experimental "Cobb" pelagic trawl. Fish on deck and those in net were taken in same tow.

Large catches were swung around to the side of the vessel and brought aboard in repeated "splits." Proficiency in estimating the weight of catches was gained through use of a precision dynamometer to weigh each split after noting the size of the bag of fish alongside the vessel (fig. 10).



Fig. 11 - A catch of 60,000 pounds of Pacific hake taken in a 30-minute tow by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb using an experimental "Cobb" pelagic trawl.



Fig. 13 - Six-thousand-pound catch of rockfish (mainly Pacific ocean perch) in cod end of "Cobb" pelagic trawl. Meshes of cod end are 3 inches (stretched measure). Note conventional splitting stap assembly.

Also, electrical connections at the winch and inside the sensor housing failed. Changes in the telemetry system were made to eliminate the cause of such failures.

### REASONS FOR LARGE CATCHES IN 1964

Larger catches obtained during 1964 sea trials compared to those taken in 1962 and 1963 sea trials are probably due to two important factors. First, during recent trials, the trawl was usually fished only after the echo-sounder indicated moderate to heavy concentrations of fish were present. In 1962 and 1963 the trawl was usually set without regard to size of fish concentrations indicated by the echo-sounder. The second factor is the improved telemetry system, which more accurately positions the depth of the trawl.

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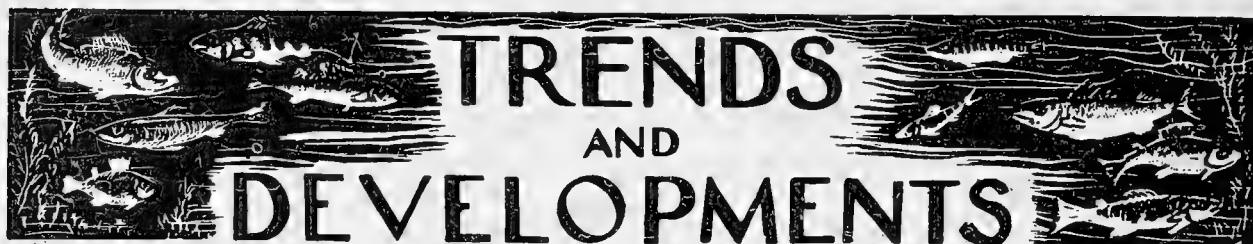


### TROUT EGGS EXCHANGED BETWEEN UNITED STATES AND YUGOSLAVIA

The hatching of about 90,000 to 100,000 Ohrid trout eggs, received from Yugoslavia earlier this year in an exchange of fish eggs with that country, was reported by the U. S. Bureau of Sport Fisheries and Wildlife National Fish Hatchery at Manchester, Iowa. In exchange, an equivalent number of Donaldson strain rainbow trout eggs from the United States were flown to Yugoslavia.

United States biologists say the eggs from Yugoslavia were quite large and exceptionally well colored, and since hatching, the "fry" were reported strong and vigorous. The imported eggs were divided between the Bureau's National Fish Hatchery at Manchester, Iowa, and the State Hatchery at Lanesboro, Minn. Some of the Ohrid trout will be retained at the Manchester Hatchery as brood fish and others will be stocked in suitable lakes on an experimental basis.

The Ohrid trout, named for a lake in Yugoslavia, normally spawn on gravel beaches and do not require flowing water as do many other trout. For that reason, researchers believe they may prove useful for stocking some lakes in the United States. Adult Ohrid trout sometimes attain a weight of 8 pounds.



# TRENDS AND DEVELOPMENTS

## Alaska

### BRISTOL BAY SALMON RUN NEARS RECORD:

The 1965 season will go on record as a bonanza year in the Bristol Bay sockeye salmon fishery. By July 26, the return of sockeye salmon to Bristol Bay this season was approximately 52 million fish, according to preliminary catch and escapement data. Inclusion of the estimated high-seas catch of Bristol Bay red salmon raises the total to 60 million.

The escapement to all Bristol Bay rivers amounted to 28 million fish with escapements to the main river as follows: Kvichak, 23.8 million; Egegik, 1.4 million; Ugashik, 817,000; Naknek, 720,500; Wood River, 674,000.

Because of a lack of cans, virtually all canning operations ceased before July 26, with many operators calling a halt to work the week before. The total catch reached 23.7 million sockeye salmon, just one million fish short of the record catch of 24.7 million established in 1938. But because of the small size of the sockeye salmon and the reduction in gill-net mesh size, the case pack of 1.4 million fell well below the 1938 record pack of 1.8 million cases. This has been the first year since 1948 that the Bristol Bay red salmon pack has been greater than one million cases. Owing largely to the preponderance of 2-ocean sockeye salmon and the smaller mesh size, the yield ran approximately  $16\frac{1}{2}$  fish per case.

There were 2,680 units of gear registered to fish the Bay during the 1965 season. About 1,900 of these were drift boats, the remainder set nets. Limits of 2,000 to 2,500 salmon per boat per day were imposed for a period of nearly three weeks beginning June 30.

The dominant age class for the three districts on the east side was the sockeye salmon arising from the 1960 spawning. Practically all of the 40 million sockeye returning

to the Kvichak were of that age group. Of interest is the large return (more than 45 million) from the 1960 Kvichak escapement of 14.5 million spawners. It remains to be seen whether this year's large run resulted from a disproportionate return of 2-ocean sockeye salmon or whether a respectable showing of 63 fish may be expected in next year's run.

\* \* \* \* \*

### SOCKEYE SALMON DISTRIBUTION PATTERN IN BRISTOL BAY AREA STUDIED:

Several rivers flowing into Bristol Bay were as red this past summer as the sockeye salmon found in them. But the red color was introduced by fishery scientists of the U. S. Bureau of Commercial Fisheries field station at King Salmon, Alaska, to trace the offshore movement of the various river waters flowing into Bristol Bay. The influence of the river waters on salmon distribution was noted. The red dye (Rhodamine B) does not last long.

The Bureau's research biologist stationed at King Salmon said, "These studies are being carried out to determine how well the various rivers such as the Naknek, Kvichak, Egegik, and Ugashik maintain their identity in the waters of Bristol Bay and how this might control the distribution and behavior of the young and adult red salmon in the Bay."

If the rivers maintain a definite course through the Bay, the salmon may identify their home stream far out into the bay and "home" on it back to their parent stream. They orient on their home stream by the sense of smell, scientists say, using their highly sensitive olfactory glands. But where do they come under the influence of their home stream? Is it 30, 40, or 50 miles out in the Bay? The tests being made may tell. (This is the "home stream theory"--salmon detect their home stream and are guided



to the natal gravel.) So the rivers flowing in a discrete course through the Bay may control the distribution and behavior of adult salmon that are coming back to spawn in that particular river.

The dye studies have shown that the Naknek River follows a definite course in the Bay. It can be recognized at least 12 miles out in Kvichak Bay and probably farther. The route of the river water will be matched with the known route of the salmon. It then can be determined if the distribution of the river water controls the salmon.

Scientists would also like to answer the following questions: Does the river water control the distribution of the young fish going to sea? Does the river water follow certain courses through commercial fishing areas? If so, does it control the distribution of fish? To what extent is the distribution of river waters massed, modified or mixed by winds and storms? This information is important in the management of the commercial fisheries by the State because the distribution of river waters may determine stocks of red salmon in the commercial fishery and their destination for particular rivers flowing into Bristol Bay.

\* \* \* \* \*

#### FOREIGN FISHING ACTIVITY OFF ALASKA, JULY 1965:

U.S.S.R.: A slight decline in the Soviet trawling fleets in late June and early July was followed by a moderate increase in trawlers about the middle of July. Major Soviet trawling efforts were still centered in the Gulf of Alaska throughout July. A small fleet of 5 to 8 trawlers supported by a few reefers operated off Southeast Alaska from near Cape Ommaney to Cross Sound. Included in that fleet was the small group of vessels which fished off the Pacific Northwest Coast in June.

The area off Yakutat Bay once again in late July became the center of Soviet trawling. A fleet of about 55 trawlers, 13 reefers, and various support vessels were seen between Dry Bay and Icy Bay. Large quantities of ocean perch were observed on the decks of many of the trawlers and processing vessels.

With the buildup of Soviet trawling off Yakutat Bay, the fleet on Portlock Bank east



Fig. 1 - Soviet trawler hauling net containing Pacific ocean perch.

of Kodiak was reduced. By the end of July, the fleet on Portlock was estimated to include 20 trawlers, three reefers, and various support vessels.

The Soviet ocean perch fishery on Albatross Bank, which began with a small fleet in mid-June, was short lived and the area was abandoned by mid-July.



Fig. 2 - Soviet king crab factoryship Andrei Zakharov.

In the central and eastern Aleutians, generally near Segum Pass, the Soviets maintained a sizable trawling fleet throughout July. That fleet averaged about 20 to 25 trawlers, including some 10 to 12 BMRT factory trawlers, accompanied by a few reefers and serviced intermittently by support vessels. Another smaller trawling fleet of about 10 trawlers, including several additional factory trawlers, was active in the western Aleutians throughout the month.

Indications in June were that the three Soviet king crab fleets would leave the Alaska area about July 1. Apparently those indications proved accurate for the Soviet crab

vessels were not sighted since the first day of July.

During early July the Soviets apparently abandoned their shrimp fishery, for all the SRT-M trawlers formerly fishing shrimp were located with ocean perch fleets. But in late July several of the SRT-M trawlers were again shrimping near Lighthouse Rocks east of the Shumagin Islands and it was estimated there then were about 5 SRT-M's and a reefer again engaged in the shrimp fishery.

Increased Soviet whaling activity was evident during July and it was believed there were three whaling fleets operating near Alaska. They were the factoryships Aleut, Dalnii Vostok, and Vladivostok, each accompanied by about 9 whale killers. Those fleets apparently worked mainly from the western Gulf of Alaska along the Aleutian Island Chain.

Japan: The Chichibu Maru and her fleet of 12 trawlers fishing for ocean perch and flatfish were not reported during July. But it was believed they were still operating in the western Aleutians or might have left the Alaska area. The two Japanese factory trawlers which during June had been fishing between the eastern Aleutians and the Pribilof Islands were not located in July and it appeared they had left the area.



Fig. 3 - Japanese trawler in the Bering Sea with a deckload of flatfish.

Of the 23 vessels licensed by the Japanese Fisheries Agency to operate in the Gulf of Alaska fisheries in 1965, 10 had been in the area by the end of July. Those vessels, which consisted of 4 factory trawlers, 5 smaller catcher trawlers, and 1 processing reefer,

fished mainly on Albatross and Portlock Banks near Kodiak taking primarily Pacific ocean perch.



Fig. 4 - Crab boats leaving Japanese king crab factoryship in Bering Sea.

The 3 Japanese fish-meal fleets operated throughout July roughly 100 miles northwest of the Pribilof Islands. Catches observed aboard the factoryships consisted of about 70 to 75 percent Alaska pollock, with the remainder mainly flounder and sole.

During July the factoryship Einen Maru and her 15 trawlers remained on the shrimping grounds just north of the Pribilof Islands.



Fig. 5 - A large catch of crabs on the deck of a Japanese king crab mothership.

Shortly after withdrawal of the Soviet king crab fleets in early July, the Japanese Tokei Maru fleet left the area east of the Pribilofs and returned to the more typical grounds on outer Bristol Bay. The Tokei and the Tainichi Maru fleets remained on the outer Bristol Bay grounds the entire month.

The 11 Japanese high-seas salmon fleets remained well west of the International North

Pacific Fisheries Convention (INPFC) salmon abstention line (175° W.) generally throughout July. Japanese sources reported the fleets were expected to reach their catch quotas by the end of July and return to Japan in early August.

All three Japanese whaling fleets were active off Alaska during July and ranged from near Dixon Entrance off Southeast Alaska to the western Aleutians.

\* \* \* \* \*

#### JAPANESE KING CRAB RESEARCH IN BERING SEA:

Biologists of the U. S. Bureau of Commercial Fisheries visited the Japanese research trawler Kumamoto Maru which in July was engaged in trawling and bottom sampling in the Bering Sea at over 100 locations on a grid. About 5,000 male crab caught at those locations were being tagged and released to study migration and growth, and obtain life history data. Size frequencies of the commercial catch also were being collected.

\* \* \* \* \*

#### JAPANESE CRAB CONSERVATION MEASURES:

It was noted that the Japanese Fisheries Agency inspector aboard the vessel Tainichi Maru favors good conservation and directed the fishing fleet to change fishing locations when the catch of female crab reached 20 percent of the catch. A special net designed for easy removal of crab is used when the catch of females falls below 20 percent of the total catch.

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#### SOVIET SCIENTISTS OBSERVE U. S. KING CRAB RESEARCH:

Soviet king crab biologists visited the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John R. Manning on July 11. They observed the Bureau's king crab research and commercial fishing and processing activities in the Shumagin Islands area. During their visit, 2,459 king crab were tagged in study areas located off the Shumagin Islands and 3 crab-processing plants were visited to arrange for tag recoveries. An additional 370 crabs were sampled from commercial landings at Sand Point. The Soviets participated in the daily sampling work and during the visit, a mutual relationship de-

veloped between the Soviet and United States scientists, crew members, and fishermen and industry personnel. The Soviets also spent a day aboard the commercial fishing vessel Marine View.

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#### SALMON CAVIAR INDUSTRY DEVELOPING IN ALASKA:

For many years salmon roe has been considered an almost worthless byproduct of the salmon industry. The colorful pink or bright red eggs were usually discarded with the offal and dumped back into the sea. Within the last several years, however, salmon roe has received an increasing amount of attention--first as bait and more recently as salmon caviar.

In 1964, the production of salmon eggs for bait totaled about 1.5 million pounds with a wholesale value of over \$300,000. Salmon caviar production was over 850,000 pounds with a wholesale value of approximately \$750,000.

The new caviar industry has come about largely through the efforts of a Japanese firm which specializes in Alaska products for the Japanese market. The firm has set a production goal of 1,000 metric tons (2.2 million pounds) of salmon caviar for the 1965 season.

The price paid canneries for fresh salmon roe is 9 cents a pound, with the Japanese firm furnishing the labor for extracting the eggs. The firm has employed only Japanese nationals who have had extensive training in the caviar-making process. However, the firm has expressed interest in training native Alaskans to do the work. The training would extend over a period of about four seasons at which time the trainee would be considered skilled and would receive commensurate pay.



#### Alaska Fisheries Investigations

##### MIGRATION PATTERNS IN 1965 OF JUVENILE PINK SALMON:

A cruise during July 12-20, 1965, by the U. S. Bureau of Commercial Fisheries research vessels Heron and Blueboat observed and sampled juvenile pink and chum salmon

in all major summer schooling areas in South-eastern Alaska. Excellent weather conditions permitted additional observations around Cape Addington. Highlights included: (1) average fish size continued to be less than that observed in 1964, especially in the northern areas; (2) migrations to summer nurseries were later, especially in northern areas; (3) the largest pink salmon caught were found inside of Cape Muzon and may be of Canadian origin; (4) the largest summer nursery area observed so far in Southeastern Alaska includes most of Clarence Strait from Kasaan Bay to Snow Pass. Concentrations observed at Snow Pass indicated the beginning of a major migration by those fish into Summer Strait. Absence of juveniles around Cape Addington indicated a more northerly migration route for west coast of Prince of Wales Island pink and chum salmon to the Warren Island nursery area.



## California

### COD-END TRAWL TESTS AND HALIBUT-TAGGING PROJECT:

M/V "Alaska" Cruises 65-A-1 (February 24-March 5, 1965) and 65-A-4 (May 11-26): The objectives of these cruises by the California Department of Fish and Game research vessel Alaska on the Ventura Flats and Santa Barbara area were to: (1) compare fish retention in  $5\frac{1}{2}$ - and  $7\frac{1}{2}$ -inch mesh cod ends and 5- and  $7\frac{1}{2}$ -inch cod ends, (2) tag California halibut (Paralichthys californicus) longer than 500 millimeters (19.7 inches), and (3) collect supplemental age and growth information on larger fish.

All fish retained in the cod ends, except elasmobranchs, were measured. They consisted of 573 hornyhead turbot (Pleuronichthys verticalis), 442 English sole (Parophrys vetulus), 952 California halibut, and many less important species.

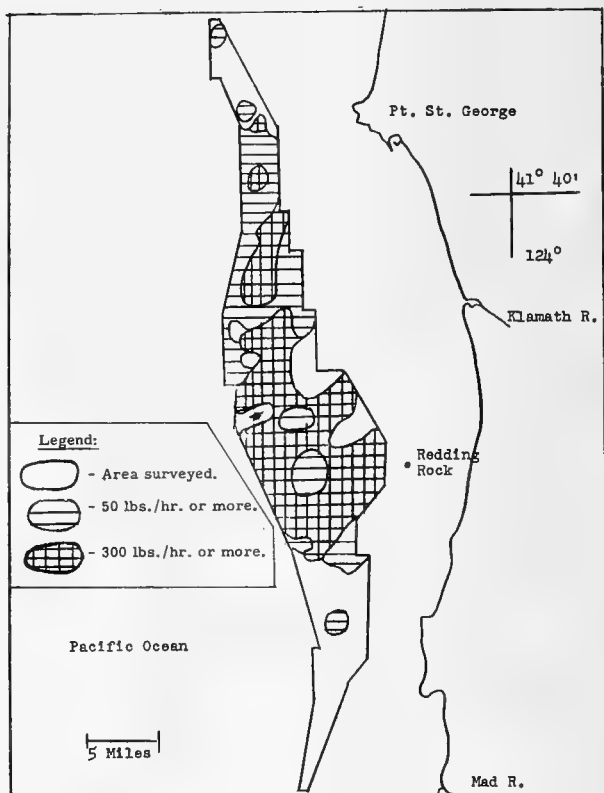
A well-defined selectivity of the various cod ends tested during the cruise showed that the calculated average weight of a 549 millimeter (21.6 inches) fish is 3.77 pounds which represents an undersized fish that cannot be marketed legally. The 297 California halibut longer than 500 millimeters that were tagged on the cruise averaged  $6\frac{1}{2}$  pounds each. Age and growth information was collected from 163 large fish up to 45 pounds.

A scientist from the "Institut für Film und Bild," Munich, Germany, who accompanied the cruise, exposed 1,200 feet of 16-mm. color film on trawling activities during the cruise.

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### SURVEY OF SHRIMP RESOURCES IN COASTAL WATERS CONTINUED:

M/V "Alaska" Cruise 65-A-5-Shrimp (June 1-July 1, 1965): The objectives of this cruise by the California Department of Fish and Game research vessel Alaska in the coastal waters from the Oregon border to Eureka, Calif., were to: (1) sample randomly concentrations of pink shrimp (Pandalus jordani) for determining population estimates and natural mortality rates; (2) determine sizes, sex, and weight of shrimp; (3) save all rare or unusual invertebrates and fish for various collections and the State Fisheries Laboratory at Terminal Island; and (4) collect stomachs from Pacific hake (Merluccius productus) and arrowtooth halibut (Atheresthes stomias) for relative abundance studies of juvenile shrimp.



M/V Alaska Cruise 65-A-5-Shrimp (Area A), June 1-July 1, 1965.

Three sets of 39 tows were completed on the cruise. The tows from each set were randomly distributed over the 270-square-mile survey area between the mouth of Mad River and the Oregon border. The average distance of each tow was  $\frac{1}{2}$  mile, thus covering an area of 75,950 square feet (assuming a net opening of 25 feet). The same net was used as on the March-April 1965 survey by the vessel Alaska--a semiballoon, Gulf of Mexico shrimp trawl with 41-foot headrope and 1-inch stretched mesh. A  $\frac{1}{2}$ -inch stretched mesh liner was used in the cod end to prevent 1-year-old shrimp from escaping. Fishing depths ranged from 40 to 100 fathoms.

The 270-square-mile survey area covered consisted of 190 square miles where 50 pounds or more per hour of shrimp could be taken. It was found that 300 pounds or more an hour (commercial concentration) could be taken in an area of 121 square miles. Average catch an hour (excluding yields under 36 pounds per hour) was 390 pounds and ranged from 36 to 3,336 pounds. It was estimated that 5.7 million pounds of shrimp remain on the bed. The shrimp count (heads-on) per pound ranged from 70 to 205, with a mean of 166 to the pound.

Several unusual cephalopods and fish caught during the cruise were sent to the California State Fisheries Laboratory for identification. A total of 83 arrowtooth halibut and 51 hake stomachs were collected and preserved for examination in the laboratory.

Note: See Commercial Fisheries Review, August 1965 p. 26.

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#### SURVEY OF CRAB RESOURCES IN COASTAL WATERS CONTINUED:

M/V "Nautilus" Cruise Report 65-N-2A-F (January 14-20, February 10-15, March 29-April 3, April 12-17, May 11-17, June 24-30, 1965): To determine if a reduced male population of dungeness or market crab (Cancer magister) is adequate to maintain the resource was the main objective of these trips. Another objective was to determine the distribution and abundance of crab larvae. The waters of central California from Point Reyes to Pedro Point were surveyed for this purpose by the research vessel Nautilus, operated by the California Department of Fish and Game.

Eight plankton stations were visited by the research vessel during each of the 6 cruises

from Point Reyes to Pedro Point. At each station, 10-minute plankton tows were made at the surface and at a depth of 10 meters (32.8 feet). The plankton was preserved in formalin for further examination. Commercial-type traps were set at selected stations to obtain male and female crabs to examine for evidence of mating. Limited trawling was conducted at stations from San Francisco to Drakes Bay.

Plankton taken on the cruise has not been analyzed completely, but preliminary examination showed crab larvae were abundant from January through March, and decreased in abundance from April to June. A few megalops of Cancer magister taken on April 14 at Drakes Bay were held in a laboratory aquarium. They molted into the first crab instar on April 30. This is the earliest the first crab instar has been noted in central California. Megalops of C. gracilis and C. productus, also taken during this study, molted into first crab instars April 20. Sea surface temperatures were lowest in May when they ranged from 9.4° C. (49° F.) at one station covered to 11.4° C. (52.6° F.) at another station near San Francisco Bay. Temperatures were highest in June, ranging from 11.6° to 13.2° C. (52.8° to 55.8° F.) in the same areas, respectively.

Female market crabs were examined for evidence of fertilization and to determine if they had carried eggs. In January, 75 percent of the females had carried or were still carrying eggs. Some mating activity was indicated by fresh mating marks on chelipods of a few male crabs. In February, more mating activity was evident--28 percent of the males had mating marks and 3 soft females were taken.

During the last of March, 71 percent of the males bore mating marks, and 13 percent of the females were soft. A total of 71 females were dissected and their spermatheca examined. In 93 percent, the spermatheca was full and white; 7 percent had spermatheca which were hard or empty, or contained a hard red plug which may have resulted from incomplete shedding of the eggs.

The April 12-17 cruise revealed 77 percent of the males had mating marks and 31 percent of the females were soft. Dissection of 40 females showed 92 percent with full white spermatheca and 8 percent empty. Ovary color ranged from white to red-orange.

Soft females generally had white ovaries, while the color changed to orange as the shell hardened.

During May, only 68 percent of the males had mating marks; the percentage drop was a direct result of molting. About 22 percent were soft and 10 percent were hard, and there was no evidence of mating among those. Of 60 females examined for evidence of fertilization, 55 had full white spermatheca, 3 had hard spermatheca, 1 had a hard red plug, and 1 immature female 4.1 inches long had not been fertilized.

In late June, 52 percent of the males were soft and mating had almost stopped. Twenty females then examined for evidence of fertilization had full spermatheca.

Note: See Commercial Fisheries Review, April 1965 p. 17.

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#### SAN FRANCISCO BAY INVESTIGATIONS CONTINUED:

M/V "Nautilus" Cruises 65-N-1A-C-D-E-F-San Francisco Bay Study (January 8-13, March 23-27, April 19-23, May 5-9, June 20-23, 1965): Studies in San Francisco Bay (south of San Pablo Bay) were resumed with these cruises by the research vessel Nautilus of the California Department of Fish and Game. Objectives were to: (1) collect fish and invertebrates routinely at six stations; (2) determine distribution and relative abundance under prevailing environmental conditions; (3) define ecological zones of the bay; and (4) determine the food organisms of the principal species and their availability.

The six stations worked in the Bay study area had an average depth ranging from 15 to 50 feet. Station locations were:  $\frac{1}{2}$  mile south-east of Redrock;  $\frac{1}{4}$  mile east of middle of east side of Treasure Island;  $\frac{1}{4}$  mile west of middle of west side of Treasure Island;  $\frac{1}{4}$  mile west of radar pylon on San Bruno shoal;  $\frac{1}{2}$  mile north of red buoy at entrance to channel to Redwood City Harbor; and  $\frac{1}{4}$  mile east of Dumbarton railroad bridge.

During the cruise a square-mouthed mid-water trawl 25 feet on a side was towed for 20 minutes at the surface. Each station was also sampled by a 20-minute bottom tow with a 15-foot otter trawl having 1-inch mesh. Six special additional otter trawl tows were made just north of the Richmond-San Rafael Bridge on May 9; two more tows were made in the same location on June 23.

Fish caught during the cruise were identical to those previously taken in the San Francisco Bay Study, except for three which were new to the study. The new species were bocaccio (Sebastes paucipinis), carp (Cyprinus carpio), and white sturgeon (Acipenser transmontanus). The addition of these 3 species brought the total of species taken in the study to 67.

Water samples for temperature and salinity determination were taken at the surface and bottom at the first 5 stations covered, and at the surface at the sixth which was in shallow water. Temperatures were almost the same as for the same months in 1963 and 1964. Salinities were very similar to those in 1963; in 1964 they were consistently higher.

Note: See Commercial Fisheries Review, April 1965 p. 18.

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#### COMMERCIAL SHRIMP FISHING AREA CLOSED FOR SEASON:

The closure of commercial shrimp fishing in Area A off the coast of northern California was announced July 27, 1965, by the California Department of Fish and Game, and became effective at midnight July 31.

Under a State law which gives the Department of Fish and Game authority to protect the shrimp resource, the ocean area is ordered closed to shrimp fishing when the annual quota established by the Fish and Game Commission has been reached. The quota for 1965 was set at 1 million pounds. Shrimp Permit Area A extends from the California-Oregon border south to False Cape.

Under a cooperative arrangement with California, the State of Oregon also orders its commercial shrimp fishermen out of the area for the remainder of the year. (California Department of Fish and Game, July 27, 1965.)

Note: See Commercial Fisheries Review, September 1964 p. 14.

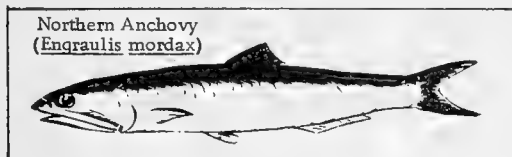
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#### PLAN SOUGHT FOR SCIENTIFIC MANAGEMENT OF ANCHOVY RESOURCE:

The California Department of Fish and Game has been instructed by its Commission to prepare a proposal for scientific management of the anchovy resource in waters off the California coast. This action is in accordance with Governor Brown's statement



when he pocket vetoed a bill that would have allowed commercial fishing for anchovies for reduction into poultry feed and other products. The Governor said in his veto message he believed management of the anchovy resource, issuance of permits for reduction, and control of the harvest could best be accomplished under jurisdiction of the Fish and Game Commission. The Governor said this would allow flexibility in the scientific management of the anchovy resource and would permit immediate closing of the fishery for reduction if at any time the resource should be threatened.



The Commission instructed the Department of Fish and Game to present a proposal for managing the anchovy resource for discussion at the Commission's meeting which was to be held in San Francisco on August 27, 1965. The Commissioner said, "Governor Brown's veto of the anchovy bill has opened the way to long-range, scientific management of the anchovy resource. Members of the Commission are aware of the will of the Legislature and the views of the Governor on this matter, and we are confident the Department of Fish and Game will present a workable scientific plan which will provide for appropriate harvesting of anchovies and at the same time will afford long-term protection of this important ocean fisheries resource."

The Commission planned to meet in Los Angeles on October 1 to give formal consideration to proposed anchovy fishing regulations developed by the California Department of Fish and Game. (The proposed regulations were developed in lieu of Assembly Bill 2756, which failed to become law.) At the October 1 meeting, statements were to be received from interested persons, after which final anchovy regulations would be adopted. (California Department of Fish and Game, July 27 and August 21, 1965.)

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#### MARINE SPORT FISH SURVEY OFF SOUTHERN CALIFORNIA CONTINUED:

Airplane Survey Flight 65-8 (July 10, 1965):  
This was the second in a series of aerial flights

conducted by the California Department of Fish and Game to make instantaneous counts of poles and fishermen along the coast. For that purpose, the southern California coastline from the Mexican Border to Jalama Beach State Park was surveyed from the air by the Department's aircraft Cessna "182" N9042T. The counts taken will eventually be used in estimating shore fishing effort in southern California during 1965.

On this flight, the California coastline was surveyed from south to north between the hours of 11:00 a.m. to 3:20 p.m. with a 1-hour stop at Goleta. A hazy overcast did not interfere with making accurate observations.

A total of 282 poles attended by 274 fishermen was counted. A total of 58 or 21 percent of the fishermen were in areas (mainly military and private) not included in the regular shoreline sampling. Greatest concentrations of fishermen were noted between Leucadia and south Laguna Beach, north Huntington Beach to the Long Beach Rainbow Pier, and Topanga Beach to Mandalay Beach. Those three areas contained over 62 percent of all fishermen counted.

The flight indicated considerable effort in private and simiclosed areas, and emphasized the need for at least bimonthly flights in order to measure that effort.

Airplane Survey Flight 65-9 (July 27, 1965): The same coastline area as on the July 10 flight was surveyed during this flight by the Cessna "182" N9042T.

The weather was generally clear throughout the surveyed area. The bright sunlight was reduced (or intensified) by various amounts of haze, smog, or a combination of both. A moderate northwest breeze began blowing late in the morning and increased in intensity by midafternoon, with sufficient strength to create whitecaps.

The survey began at 9:45 a.m. at the Mexican Border and progressed northwestward along the shoreline to Goleta Beach Park. Goleta Beach Park to Jalama Beach State Park was covered in 25 minutes flying time shortly after noon. The entire survey was made from an altitude of 500 feet.

The count on this flight was 119 fishing poles. It was not practical to count the people attending the poles because of the large

number of bathers and onlookers, and the altitude of the plane. Small groups of fishermen (e.g. poles), numbering up to 3 or 4, were well spread out along the entire coast except for a concentration of 37 poles near the Mandalay Steam Plant (between Port Hueneme and Ventura).

Three broad areas were observed to be infested with a well developed "red tide", from Seal Beach south of Laguna Beach, Santa Monica Bay (a relatively narrow band paralleling the shoreline), and Ventura to Port Hueneme. Areas west of Ventura were relatively free of red tide, with pockets of crystal-clear water. Los Angeles-Long Beach harbor had its usual murky color with an intense spot of red near Belmont Shore Pier.

Note: See Commercial Fisheries Review, August 1965 p. 27.



## Cans--Shipments for Fishery Products, January-June 1965

A total of 1,452,157 base boxes of steel and aluminum was consumed to make cans shipped to fish and shellfish canning plants in January-June 1965 as compared with 1,347,894 base boxes used during the same period in 1964. It is believed that somewhat larger shipments to the Pacific or Western Area (principally for salmon and tuna) and also to the Eastern Area (for the Maine sardine packing season) accounted for the increase in 1965.



Note: Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14" x 20" size. Tonnage figures for steel (tinplate) cans are derived by use of the factor 23.7 base boxes per short ton of steel.



## Central Pacific Fisheries Investigations

### EQUIPMENT TESTED FOR SAMPLING TUNA LARVAE:

M/V "Charles H. Gilbert" Cruise 83 (June 7-24, 1965): To make a series of surface hauls with both plankton and neuston nets in order to determine their effectiveness for sampling tuna larvae and juveniles was the primary objective of the cruise. The leeward waters off the island of Oahu was the area covered by the research vessel Charles

H. Gilbert of the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii.

During the cruise, simultaneous 1- and 2-meter (3.3 and 6.6 feet) net hauls were made at 68 stations worked by the vessel. Four hauls at various intervals were made each night for 17 nights. The 2-meter net caught more tuna larvae than the 1-meter net, but the catch ratio between the two nets was closer to 2:1, rather than the 4:1 ratio expected on the basis of volume of water strained. The 2-meter net performed satisfactorily in deep oblique tows.

A 20-minute surface haul was made with the neuston net at each of the 68 stations. The net was generally towed at 5-6 knots. Catches were poor--only up to 5 or 6 juvenile fish per haul at a few stations. At most stations only a few hundred copepods and other invertebrates were taken. The largest fish taken was a 15-inch long half-beak (Hemiramphidae). No tuna was taken.

A total of 24 skipjack tuna, 17 yellowfin, and 14 "albacore" (Ueyanagi's description) eye lenses were collected from plankton samples and dry-frozen during the cruise. Other operations included the release of drift cards and collection of bathythermograph (BT) data.

Bright moonlight throughout the cruise period reduced the catches of larval tuna considerably. Hauls made in darkness prior to moonrise or after moonset yielded better catches than those made when the moon was high. Very few birds were seen in the area; several bird flocks were seen on two occasions near the end of the cruise.

\* \* \* \* \*

### SKIPJACK TUNA BIOLOGICAL STUDIES CONTINUED:

M/V "Charles H. Gilbert" Cruise 84 (July 12-16, 1965): The collection of live mackerel-like (scombrids) species for behavior studies was one of the main objectives of this cruise by the research vessel Charles H. Gilbert, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii. The area covered was south of Oahu between Mokuumanu and Kaena Pt., and not more than 20 miles from shore.

Other objectives of the cruise were to:  
(1) collect tuna specimens for density deter-

minations, (2) determine weight lost from medium and large skipjack tuna after removal of head and viscera, (3) take photographs of fishing operations, and (4) collect water samples for bacteriological study.

Caught during the cruise and returned live to the Bureau's facility at Kewalo Basin were 103 skipjack tuna, 7 frigate mackerel, 1 little tuna, and 1 yellowfin.

Fishing operations were photographed as planned, water samples were obtained, and the usual standard watch for fish, birds, and aquatic mammals was maintained. Thermograph and barograph equipment was operated continuously.

Troll lines were kept out continuously during the cruise between Kewalo Basin and each fishing station covered; total trolling time was 16 hours and 50 minutes. Two mahimahi (*Coryphaena hippurus*), better known as dolphin, were caught.

Note: See Commercial Fisheries Review, September 1965 p. 20.

\* \* \* \* \*

#### RESULTS OF PLANKTON NET TESTS IN HAWAIIAN WATERS:

Probably the most elusive fish in the sea are those from a few days to a few weeks old. They do not appear in the commercial catch (except in the stomachs of other fish) and often are able to swim fast enough to dodge the nets that marine biologists use to collect the plankton, the drifting plants and animals of the ocean. Specimens of the larval fish are essential in the study of many fishery problems.

The net commonly used to collect plankton is one meter (39.4 inches) in diameter at its mouth. It has been suggested that a net with a larger mouth opening might be able to catch more of the larval fish, which would have farther to swim to escape the oncoming net.

Recently, a biologist at the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii, designed and constructed a square net 2 meters to the side and towed it and a standard 1-meter net simultaneously, the 2-meter net on the starboard side, the 1-meter net on the port side of the Laboratory's research vessel Charles H. Gilbert (Cruise 83, June 7-24, 1965). Both nets were weighted to keep them just below

the surface of the water. Towing speed, usually about 3 knots when the 1-meter net alone is used, had to be restricted to about 2 knots to keep the larger net from breaking the surface.

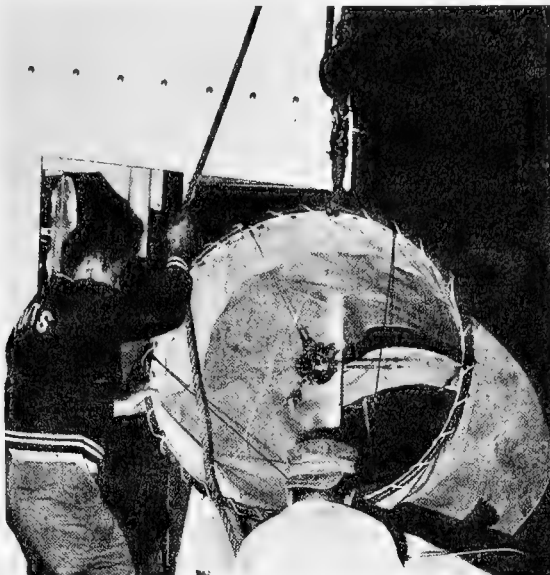


Fig. 1 - A standard plankton-collecting net with 1-meter mouth opening.

Four hauls were made each night for 17 consecutive nights on the lee side of the island of Oahu (on which Honolulu is located) and in waters fished by the commercial fishing fleet for skipjack tuna, the predominant species in the Hawaiian commercial fish catch.

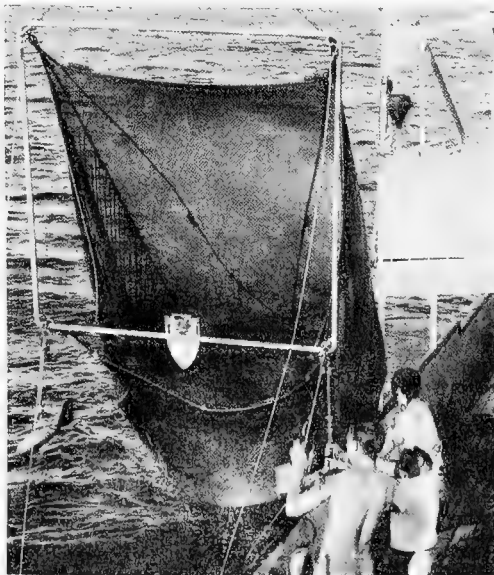


Fig. 2 - A plankton net with 2-meter opening to the side (designed by a U.S. Bureau of Commercial Fisheries biologist).

Both skipjack and yellowfin tuna larvae were taken, the skipjack being many times more plentiful. The larger net caught more of the larger larvae, about a quarter of an inch long, than did the 1-meter net. The Bureau biologist who designed the larger net said that it may have been possible for more of the larger larvae to dodge the 1-meter net. Although the 2-meter net caught nearly twice the number of tuna larvae that the 1-meter net did, on the theoretical basis of volume of water strained, the catches fell short of the expected 5 to 1 ratio. (Being 2 meters square, the larger net has a mouth area 5 times that of the 1-meter net.)

There were two circumstances bearing on that cruise by the Laboratory's research vessel that had particularly interesting implications for research on larval tuna. Bright moonlight prevailed throughout the cruise period. When a tow was made in complete darkness prior to moonrise or after moonset, or when the moon was low, the larval catches were good. During such periods, the 2-meter net caught from 16 to 61 larvae in each tow. When the moon was bright, catches were poor, from no larvae at all to 9 a tow. When the moon was obscured by cloud cover for some time before the tow, the catch would be similar to that made in darkness.

The other circumstance related to the distribution of the skipjack tuna fishery. When Cruise 83 began, fishing had been good on the lee side of Oahu. Shortly afterward, the fishery moved southeastward toward the island of Hawaii, following the adult skipjack. For a week and a half the vessel made good

larvae catches in the lee of Oahu, apparently collecting larvae that had been spawned there before the adults left the area. Then in a matter of a day or two, larval catches dropped to almost nothing.

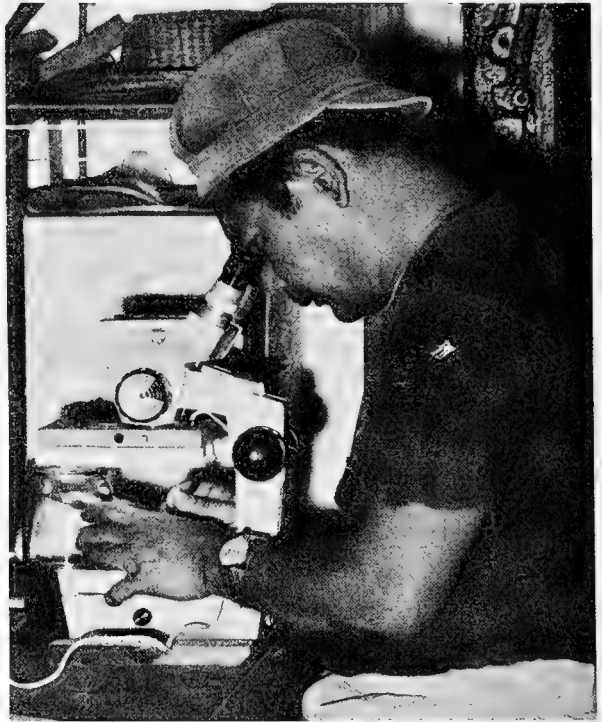


Fig. 4 - Plankton samples being analyzed at sea.

A second mission of the Charles H. Gilbert cruise was to test the British neuston net, a small net attached to a sled pulled rapidly through the water. It is designed to catch sea animals in the surface layer (the neuston). In the Arabian Sea, where it was first used, a 15-minute tow yielded over 1,000 young frigate mackerel (a small tunalike fish), measuring from  $\frac{5}{8}$ -inch to  $1\frac{1}{2}$  inches long, a size very difficult to capture by conventional techniques. Off Oahu, it was towed for 20 minutes at each of the 68 stations covered at a speed of about 5 knots. Catches were extremely poor. This may have been due to the prevailing moonlight, the Bureau's biologist said.

\* \* \* \* \*

#### SUBMARINE STUDIES OFF HAWAII:

The 2-man submarine Asherah was scheduled to arrive in Hawaii on September 11, 1965, to spend a month making research dives for the U. S. Bureau of Commercial

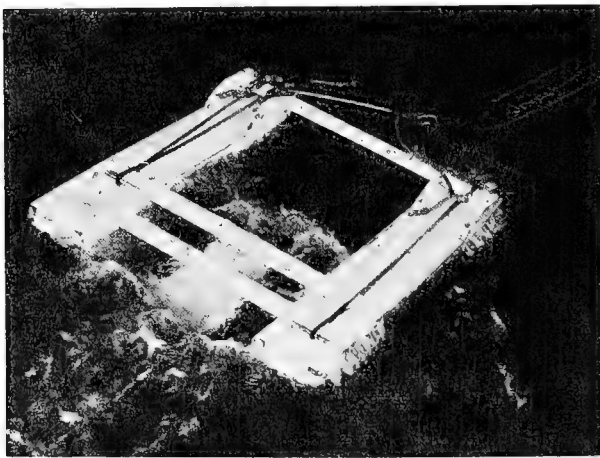


Fig. 3 - British-designed neuston plankton net (small net attached to floats on either side).

Fisheries Biological Laboratory in Honolulu. Plans called for the craft to work a 6-day week, making daily dives in the vicinity of Barber's Point, after being towed to sea by the Honolulu Laboratory's research vessel Townsend Cromwell. During operations at Barber's Point, the Asherah was to dock at the Nenuë, a 12-foot-square raft anchored in water 1,000 to 1,500 feet deep.

The Asherah is 16 feet long. Battery powered, she is capable of a speed of 4 knots submerged. Pilot and observer sit in bucket seats in a 6-windowed sphere 5 feet in diameter. The Asherah is completely maneuverable in all directions. It may power itself to the surface, to the bottom, or hover. It is equipped with an underwater telephone to maintain continuous contact with surface facilities. Its maximum operating depth is 600 feet. There are two motors, one mounted on each side.

A series of research projects bearing on the commercial potential of Hawaiian waters have been planned for the submarine. One investigation will consist of a survey of the fishery potential of the bottom area. The rocky bottom off the Hawaiian coast has been little studied. The Asherah offers scientists their first opportunity to make direct observations of the creatures that live there. Some of those might have commercial potentials.

In another study, long-line fishing gear will be set out by the Townsend Cromwell and observed by the submarine. In long-line fishing, hooks are attached to drop lines which hang from the long-line. It is a method used by a part of the Hawaiian fleet and with great success by Japanese fishermen.

No one before has had the chance to observe what actually is happening at the long-line hooks several hundred feet below the sea surface. Scientists are particularly interested in whether the fish approach the hooks in schools or whether they are dispersed. The question is one of more than academic interest--if the fish are in schools, perhaps new and more efficient methods could be developed to catch them in commercial quantities.

In a related study, a series of large objects (10-foot discs) will be attached at 100-foot intervals to the Nenuë's anchor chain. It is known that fish gather about floating objects at sea. It is also known that they gath-

er around large objects on the sea bottom. Now it will be possible to see if the 10-foot discs act as "fish collectors" in the intervening layers of the sea.

Other studies are aimed at understanding the forage or food of tuna. This consists of the small animals that make up the plankton and the larger animals, such as fish and squid, which feed upon plankton. Plankton is known to rise to the surface at night and descend during the day. Sometimes there are clouds of plankton so thick that it reflects underwater sound, a phenomenon that puzzled the U. S. Navy during World War II. There have been few opportunities for scientists to observe these "deep scattering layers" directly. A planktologist will make several dives to investigate the phenomenon, and another scientist will observe the fish associated with the plankton layers.

Another investigation will find the Townsend Cromwell towing standard plankton collecting nets while the Asherah follows to allow observations of the behavior of fish and other creatures as the net approaches.

In another study, the attenuation of light beneath the sea surface will be measured.

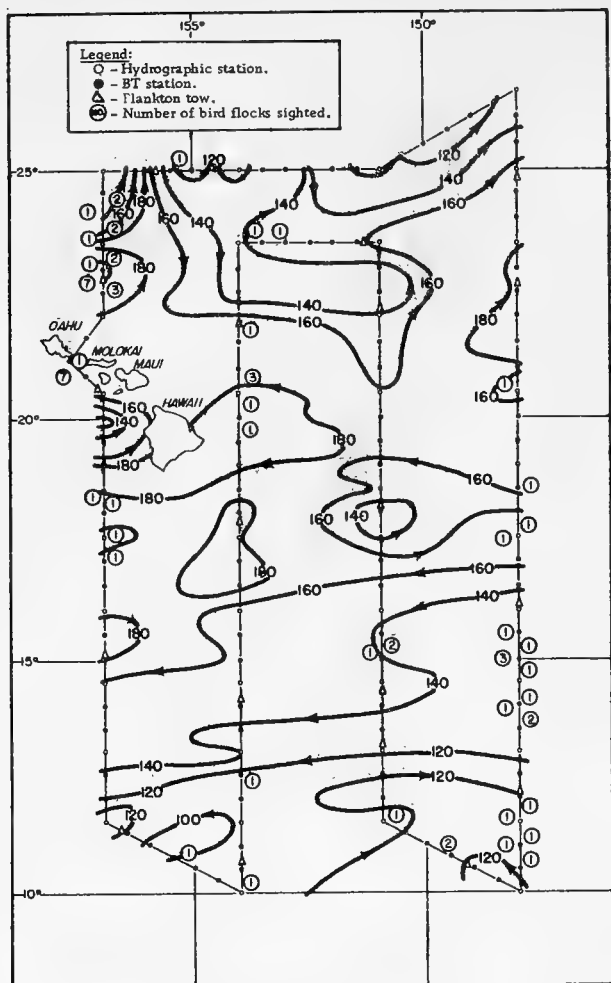
Oceanographic studies will include observations on oceanic fronts. The Asherah will also be used as a "drift bottle" by letting it drift at different depths and then surface to determine the distance traversed.

Scientists from the University of Hawaii also planned studies with the Asherah.

Note: See Commercial Fisheries Review, Aug. 1965 p. 50.

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FINAL CRUISE COMPLETES  
FIRST PHASE OF TRADE WIND ZONE  
OCEANOGRAPHIC RESEARCH PROJECT:  
M/V "Townsend Cromwell Cruise 17"  
(June 10-July 2, 1965): This was the last in a series of oceanographic cruises to determine rates of change in the distribution of properties in the trade wind zone of the central North Pacific (latitude 10° N., 27° N. and longitude 148° W., 158° W.). A total of 43 oceanographic stations was occupied by the U. S. Bureau of Commercial Fisheries research vessel Townsend Cromwell along the cruise track. At each station, temperatures and samples for salinity analysis were obtained at various depths, and several deep



Track chart of research vessel Townsend Cromwell Cruise 17 (June 10-July 2, 1965), showing the geostrophic interpretation of the 20° isotherm.

casts ranging up to 5,000 meters (16,404 feet) were taken at designated stations.

The overall circulation pattern for June was similar to that observed in May 1965 (Cruise 16). But there were a few noticeable changes in the system of eddies and the directions of the flow lines. The large clockwise circulation seen during the previous month around the Islands had since broken down into a number of smaller systems. A relatively intense counterclockwise eddy had appeared just west of Hawaii. A similar eddy seen in May at 19° N., 148° W., appeared to have moved westward. To the north of the Islands, the generally eastward flow had begun to curve back to the north and northwest, forming a large counterclockwise flow. South of the Islands, the westerly flow seemed to be moving at about the same intensity as dur-

ing May, as judged by the slopes of the isotherms.

A slight cooling of the surface waters was seen in the northeastern sector of the study area, where temperatures of less than 23.0° C. (73.4° F.) were registered. During May, the lowest temperatures were about 23.5° C. (74.3° F.). In the southern section, however, the 26.5° C. (79.7° F.) isotherm had moved northward.

A total of 69 bird flocks was sighted on the cruise as compared with 62 during the May cruise. A large number of those flocks were seen in the southeast sector in contrast to the May distribution.

Other operations during the cruise included the usual series of bathythermograms and surface plankton tows, the use of a Hytech *in situ* salinity-temperature-depth recorder, release of drift bottles, and collection of other oceanographic data.

Note: See *Commercial Fisheries Review*, September 1965 p. 21.



## Columbia River

### SALMON FISHERY REOPENED BELOW BONNEVILLE DAM:

Commercial fishing for salmon in the Columbia River was resumed July 29, 1965, in Area 1 (between the mouth of the river and a point 5 miles downstream from Bonneville Dam). The commercial fishery in that area was scheduled to continue (with weekend closures) until August 25, 1965.

The Columbia River below Bonneville Dam was also reopened to sport salmon fishing on July 29, 1965, but the ban on sport fishing above Bonneville Dam was to continue until August 20, 1965.

The Columbia River had been entirely closed to salmon fishing since late June 1965. The opening below Bonneville Dam was designed to harvest the early fall chinook and coho salmon runs in the river. (Washington State Department of Fisheries, July 28, 1965.)

Note: See *Commercial Fisheries Review*, Aug. 1965 p. 33.





## Crab Meat

### PLASTIC CONTAINER APPROVED BY MARYLAND:

A plastic container for use in packing fresh-picked pasteurized crab meat has been approved by the Maryland State Health Department. The plastic container when properly used provides an overall product protection equal to the metal cans now in use, according to tests made by the University of Maryland's Seafood Processing Laboratory at Crisfield, Md.

Announcing approval of the plastic container on July 7, 1965, a Maryland State Health official said, "if pasteurized at the recommended temperature of 185° F. for 110 minutes and refrigerated properly, there is no reason why crab meat can not be marketed in these packages which have an obvious added consumer appeal." Industry representatives were cautioned, however, that those using the new plastic containers must follow the pasteurization process worked out by the Seafood Processing Laboratory. Industry members were also urged to visit the Laboratory and observe the correct method of sealing plastic cans.

The technician in charge of the Laboratory tests of the new container said, "there was no significant difference in taste or appearance between the meat stored in the metal and the plastic containers for the first 4 months of storage, but after this period our taste panels definitely preferred the crab meat stored in plastic. There was no significant difference in the texture of the meat during the entire 6 months storage cycle we had set for the tests." (Natural Resources Institute, University of Maryland, College Park, Md.)



## Fish Sticks and Portions

### U. S. PRODUCTION, APRIL-JUNE 1965:

United States production of fish sticks and fish portions amounted to 51.0 million pounds during the second quarter of 1965, according to preliminary data. Compared with the same quarter of 1964, this was an increase of 12.1 million pounds or 31.2 percent. Fish portions (32.5 million pounds) were up 9.4 million pounds or 40.6 percent, and fish sticks (18.5 million pounds) were up 17.4 percent.

Table 1 - U. S. Production of Fish Sticks by Months and Type, April-June 1965 1/

Month	Cooked Raw Total		
	. . . (1,000 Lbs.) . . .		
April . . . . .	6,051	286	6,337
May . . . . .	5,041	356	5,397
June . . . . .	6,513	250	6,763
Total 2nd Qtr. 1965 1/ . . . . .	17,605	892	18,497
Total 2nd Qtr. 1964 2/ . . . . .	14,419	1,330	15,749
Total 1964 2/ . . . . .	67,810	5,722	73,532

1/ Preliminary.  
2/ Revised.

Table 2 - U. S. Production of Fish Portions by Months and Type, April-June 1965 1/

Month	Breaded			Un-breaded	Total
	Cooked	Raw	Total		
	. . . . . (1,000 Lbs.) . . . . .				
April . . . . .	2,260	8,190	10,450	196	10,646
May . . . . .	1,725	8,602	10,327	233	10,560
June . . . . .	1,648	9,498	11,146	179	11,325
Tot. 2nd Qtr. 1965 1/	5,633	26,290	31,923	608	32,531
Tot. 2nd Qtr. 1964 2/	4,891	17,807	22,698	442	23,140
Total 1964 2/	20,956	82,135	103,091	2,541	105,632
1/Preliminary. 2/Revised.					

1/ Preliminary.  
2/ Revised.

Cooked fish sticks (17.6 million pounds) made up 95.2 percent of the April-June 1965 fish stick total. There were 11.1 million pounds of breaded fish portions produced, of which 9.5 million pounds were raw. Un-breaded fish portions amounted to 179,000 pounds.

The Atlantic States remained the principal area in the production of both fish sticks and fish portions, with 14.1 and 20.0 million pounds, respectively. The Inland and Gulf States ranked second with 11.8 million pounds of fish portions. The Pacific States ranked second with 2.3 million pounds of fish sticks.



## Great Lakes

### LAKE TROUT REHABILITATION PROGRAM:

Projects that are under way to revitalize the lake trout fishery in the Great Lakes include: (1) initial restocking of that species in Lake Michigan, (2) completion of the first round of lampricide treatment of that lake's tributary streams, and (3) substantial additional plantings of young lake trout in Lake Superior.

During summer 1965 more than 1.2 million yearling lake trout were set free in northern Lake Michigan where sea lamprey are

expected to be substantially reduced by 1967. Due to their small size, the lake trout are expected to be safe from attacks by the predators during the next two years. Chemical treatment of Lake Michigan's lamprey-spawning streams was started in 1960, and all 99 streams will have had at least one application of lampricide by spring 1966.

Another step in the lake trout rehabilitation program calls for closing Lake Michigan to commercial fishing for that species in order to protect the hatchery lake trout planted in the lake. The State of Michigan Department of Conservation scheduled public hearings this past July to consider a proposal to adopt a regulation for that purpose effective October 1, 1965. Wisconsin was expected to impose a similar measure for its Lake Michigan waters.

In Lake Superior, more than 1.8 million young lake trout were to be planted during summer 1965, bringing the total in this restoration project to nearly 12 million fish. Of the total number of young lake trout to be released in 1965, about 1.3 million will be in United States waters and about 500,000 in the Ontario section of Lake Superior. (Great Lakes News Letter, May-June 1965.)

Note: See Commercial Fisheries Review, August 1965 p. 37.



## Great Lakes Fisheries Explorations and Gear Development

### LAKE HURON TRAWLING STUDIES:

M/V "Kaho" Cruise 27 (July 14-August 4, 1965): This 21-day cruise in Lake Huron and Saginaw Bay was the first in a series of cruises to explore the potential of developing more effective and efficient methods for catching and handling fish stocks in Lake Huron.

The primary objectives of the cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Kaho were to determine the location, bathymetric distribution, abundance and seasonal availability of various species of fish to bottom trawls, and to locate areas suitable for bottom trawling. Since yellow perch were not taken in Saginaw Bay in the amounts expected, the cod-end mesh size selectivity study planned for that species was cancelled and the time used to extend explorations into a larger segment of

Lake Huron than was originally intended. Other activities included collecting fish and bottom samples for botulism and limnological investigations.

Trawl fishing in the Saginaw Bay area of Lake Huron revealed alewife and carp populations of sufficient size to support a high-volume fishery that could produce raw material for the manufacture of pet food, mink food, or fish meal. Further seasonal assessments are needed, however, to verify the true potential for such a fishery. A total of 24 out of 31 half-hour drags in that area yielded catches ranging from 250 to 1,650 pounds, and averaging 610 pounds. Catch rates of 250 pounds or more with the relatively small standard sampling net used for explorations are considered of commercial significance even for low-value species. The total catch of 21,010 pounds was composed of 86 percent alewife, 5.5 percent carp, 5 percent smelt, 2 percent chub, and 1.5 percent other species.

**FISHING OPERATIONS:** A total of 84 drags was made during the cruise--31 in Saginaw Bay and 53 in the open lake. All drags were made with a standard 52-foot (headrope) Gulf of Mexico-type fish trawl, each lasting 30 minutes except for 11 drags which were ended early due to snags, rough bottom conditions, or set fishing gear. Gear damage occurred on 12 drags. The damage was only minor on 4 of them, but major net damage or loss occurred during the other 8 drags. The incidence of gear damage was much greater from Harrisville north, where 1 out of 3 drags resulted in gear damage. The rate of gear damage south of Harrisville was only 1 out of 18 drags.

**FISHING RESULTS (Saginaw Bay):** The results of fishing in Saginaw Bay indicate a large abundance of alewife which accounted for 90 percent of the catch. Carp made up 8 percent and smelt 1.5 percent. Only 47 pounds of yellow perch were landed during the entire cruise.

The average catch rate for all species in Saginaw Bay each half hour was 521 pounds, 467 pounds of which were alewife. The best individual catches of alewife (1,000 and 1,600 pounds) were taken in 12-15 fathoms in mid-bay between Tawas City and Huron City. The best catch of carp was 400 pounds taken in 4 fathoms off Pt. Au Gres; and the best smelt catch was 98 pounds taken in 17 fathoms NW.

of Port Austin. Other species were caught in small amounts only. Species other than alewife, carp, yellow perch, smelt, and chub in Saginaw Bay trawl catches included small amounts of catfish, sucker, spottail shiner, and a few pounds of common whitefish and trout-perch.

**FISHING RESULTS (Lake Huron):** With the exception of good catches of 700, 900, and 1,300 pounds of alewife taken off Oscoda and Huron City, catches of all species were very light in the open lake. The average catch for each half-hour drag in Lake Huron was only 124 pounds, of which 97 pounds were alewife. The species composition for all drags in the open lake was: alewife 79 percent, smelt 13 percent, and chub 6 percent. Other species taken amounted to only 2 percent of the catch. The highest catch rate of alewife during the cruise was at 15 fathoms off Huron City where a 10-minute drag yielded 900 pounds--a half-hour catch rate of 2,700 pounds.

Off Harbor Beach and Port Hope, catches were very light with the best consisting of 160 pounds. North of Harrisville, catches were also very light and averaged only 82 pounds a drag. Two-thirds of the total quantity landed in the northern end of the lake (less than a ton) were alewife. The best catch of alewife in northern Lake Huron was 300 pounds taken in St. Martins Bay. The best smelt catch of the cruise was 100 pounds taken in 25 fathoms off Harrisville, and the best catch of chubs (mostly bloaters) was 80 pounds taken in 35 fathoms off Alpena.

Species other than alewife, chub, and smelt in the open Lake Huron trawl catches included stickleback (68 pounds), sculpin (24 pounds), round whitefish (16 pounds), common whitefish (15 pounds), long-nose sucker (16 pounds), and very small amounts of several other species.

**HYDROGRAPHIC DATA:** During the cruise, thermal gradients were recorded using a bathythermograph and continuous surface temperature recorder. Bottom temperatures ranged from 41° to 70° F. and surface temperatures ranged from 42° to 70° F.

Note: See Commercial Fisheries Review, Sept. 1965 p. 28.



## Gulf Fisheries Explorations and Gear Development

### SURVEY OF BOTTOM-TRAWL FISH POTENTIAL OFF FLORIDA WEST COAST:

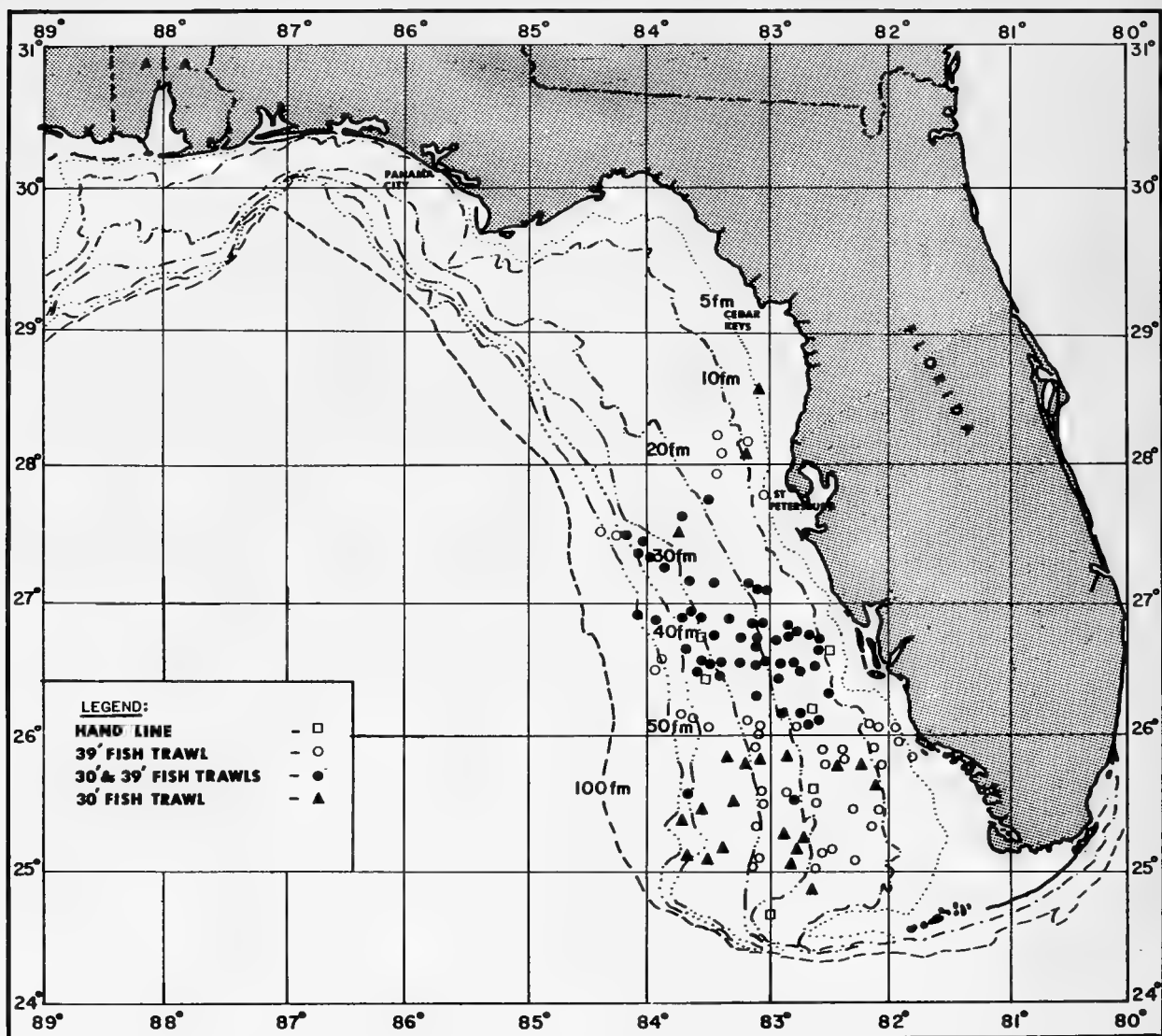
M/V "Hernan Cortez" Cruise 2 (May 22-July 12, 1965): This was the second cruise of a two-month survey of the bottom-trawl fish potential off Florida's west coast by the Florida Conservation Department research vessel Hernan Cortez. The project, conducted under a cooperative agreement between the Florida Conservation Department and the U. S. Bureau of Commercial Fisheries, was designed to determine the species present in the area and to obtain information on their availability to trawling gear within the 5- to 50-fathom depth range.

Exploratory transects were made in depths from 5 to 50 fathoms between Tampa Bay and Dry Tortugas. A total of 129 fishing stations were completed, of which 6 were hand-line stations, 2 were fish-trap stations, and the rest were 30-foot and 39-foot roller-rigged trawl stations. Objectives were to assess the fish species in the area, principally bottomfish of potential commercial value, and to determine operational conditions in the area during that time of year.

Trawl catches of marketable finfish during the cruise were considered less than commercial in all but one drag where 160 pounds of grouper and snapper were taken with the 39-foot trawl. A follow-up drag made over a reciprocal course, using both trawls simultaneously, resulted in a combined catch below commercial scale. In many of the drags made, the size range of commercial species was under acceptable market size and considered noncommercial.

Operational conditions in the area covered were generally good. In certain areas between Fort Myers and Cape Romano (in depths from 10 to 25 fathoms), bottom "grasses" hindered satisfactory trawling. Loggerhead and fire sponges were also present in a number of drags but not in sufficient amount to hamper fishing. Trawling with the roller-rigged nets was accomplished over much rough bottom without appreciable gear damage. Only one hang-up occurred, and the gear was not damaged in that instance.

Fish catches of commercial interest included gray snapper, lane snapper, and red



Shows area of operations during cruise by research vessel Hernan Cortez (May 22-July 12, 1965).

and black grouper. Vermilion snapper, with one exception, were caught less frequently and were of smaller size than in the previous cruise of the Hernan Cortez (April-May 1965). Catches of Spanish lobster, in general, were progressively less frequent as the trawling operation moved southward from Tampa Bay to the Dry Tortugas area.

Surface school fish were observed usually inside the 10-fathom depth contour with the greatest concentrations occurring near Tampa Bay, Fort Myers Beach, and Cape Romano. Trolling lines fished between stations caught little tuna, king mackerel, and Spanish mackerel. Routine meteorological and water tem-

perature data were recorded throughout the cruise.

Note: See Commercial Fisheries Review, August 1965 p. 39.



## Industrial Fishery Products

### U. S. FISH MEAL, OIL, AND SOLUBLES:

Production by Areas, July 1965: Preliminary data on U. S. production of fish meal, oil, and solubles for July 1965 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International

U.S. Production <sup>1/</sup> of Fish Meal, Oil, and Solubles, July 1965 (Preliminary) with Comparisons			
Area	Meal Short Tons	Oil 1,000 Pounds	Solubles Short Tons
July 1965:			
East & Gulf Coasts 2/ . . . .	43,306	35,733	16,961
West Coast 3/ . . . . .	3,639	1,998	1,529
Total . . . . .	46,945	37,731	18,490
Jan.-July 1965			
Total . . . . .	134,966	112,003	52,950
Jan.-July 1964			
Total . . . . .	141,827	112,402	57,039
1/Does not include crab meal, shrimp meal, and liver oils.			
2/Includes a small quantity from the Great Lakes.			
3/Includes American Samoa and Puerto Rico.			

Association of Fish Meal Manufacturers are shown in the table.

\* \* \* \* \*

Major Indicators for U. S. Supply, June 1965: United States production of fish meal and fish oil in June 1965 was lower by 6.8 and 6.4 percent, respectively, as compared with June 1964. Production of fish solubles was lower by 8.2 percent.

Major Indicators for U. S. Supply of Fish Meal, Solubles, and Oil, June 1965					
Item and Period	1/1965	1964	1963	1962	1961
Fish Meal: Production: . . . . . (Short Tons) . . . . .					
June	45,605	48,953	34,863	61,171	54,399
Jan.-June 2/	88,021	96,651	91,079	121,836	102,502
Year 3/	-	235,252	255,907	312,259	311,265
Imports:					
June	44,474	34,515	18,452	26,453	19,317
Jan.-June	209,858	256,429	181,934	140,886	107,826
Year	-	493,143	376,321	252,307	217,845
Fish Solubles 4/:					
Production:					
June	17,329	18,873	15,430	24,725	17,772
Jan.-June 2/	34,460	39,025	42,825	51,487	40,200
Year 3/	-	93,296	107,402	124,649	112,254
Imports:					
June	224	249	323	872	207
Jan.-June	3,230	2,051	2,439	4,290	1,219
Year	-	4,505	7,112	6,308	6,739
Fish Oils: Production: . . . . . (1,000 Lbs.) . . . . .					
June	40,124	42,861	28,193	54,924	49,686
Jan.-June 2/	74,272	78,624	69,589	96,522	89,025
Year 3/	-	180,198	185,827	250,075	258,118
Exports:					
June	18,111	117	255	4,921	21,035
Jan.-June	30,170	56,139	97,806	63,005	68,128
Year	-	151,469	262,342	123,050	122,486
1/Preliminary.					
2/Data for 1965 based on reports which accounted for the following percentage of production in 1964: Fish meal, 89 percent; solubles, 89 percent; and fish oils, 99 percent.					
3/Small amounts (10,000 to 25,000 tons) of shellfish and marine animal meal and scrap not reported monthly are included in annual totals.					
4/No homogenized fish was produced in 1964 or during the first 6 months of 1965.					

\* \* \* \* \*

Production, June 1965: During June 1965, a total of 45,605 tons of fish meal and 40.1 million pounds of marine-animal oil was produced in the United States. Compared with June 1964 this was a decrease of 3,348 tons of fish meal and about 2.7 million pounds of marine-animal oil. Fish solubles production amounted to 17,329 tons--a decrease of 1,544 tons as compared with June 1964.

U. S. Production of Fish Meal, Oil, and Solubles, June 1965 <sup>1/</sup> with Comparisons					
Product	June		Jan.-June		Total 1964
	1/1965	1964	1/1965	1964	
	. . . . . (Short Tons) . . . . .				
Fish Meal and Scrap:					
Herring	1,041	1,228	2,392	1,643	8,881
Menhaden 2/	38,478	39,683	64,476	65,430	160,349
Tuna and mackerel	2,398	2,347	11,397	8,832	21,113
Unclassified	3,688	5,695	9,756	20,746	34,809
Total	45,605	48,953	88,021	96,651	225,152
Shellfish, marine-animal meal and scrap	3/	3/	3/	3/	10,100
Grand total meal and scrap	3/	3/	3/	3/	235,252
Fish Solubles:					
Menhaden	14,883	15,819	25,072	26,588	68,738
Other	2,446	3,054	9,388	12,437	24,558
Total	17,329	18,873	34,460	39,025	93,296
	. . . . . (1,000 Pounds) . . . . .				
Oil, body:					
Herring	431	2,089	1,013	2,221	10,354
Menhaden 2/	38,463	39,599	69,919	71,142	157,730
Tuna and mackerel	326	381	1,684	1,508	4,816
Other (including whale)	904	792	1,656	3,753	7,298
Total oil	40,124	42,861	74,272	78,624	180,198
<sup>1/</sup> Preliminary data.					
<sup>2/</sup> Includes a small quantity of thread herring.					
<sup>3/</sup> Not available on a monthly basis.					

\* \* \* \* \*

## U. S. FISH MEAL AND SOLUBLES:

Production and Imports, January-June 1965: Based on domestic production and imports, the United States available supply of fish meal for the first 6 months in 1965 amounted to 297,879 short tons--55,201 tons (or 15.6 percent) less than during the same period in 1964. Domestic production was 8,630 tons (or 8.9 percent) less, and imports were 46,571 tons (or 18.2 percent) lower than in January-June 1964. Peru continued to lead other countries with shipments of 178,856 tons.

The United States supply of fish solubles during January-June 1965 amounted to 37,690 tons--a decrease of 8.2 percent as compared with the same period in 1964. Domestic production dropped 11.7 percent, but imports of fish solubles increased 57.5 percent.

U. S. Supply of Fish Meal and Solubles, January-June 1965			
Item	Jan.-June		Total 1964
	1/1965	1964	
	. . . . .(Short Tons). . . . .		
<b>Fish Meal and Scrap:</b>			
<b>Domestic production:</b>			
Menhaden . . . . .	64,476	65,430	160,349
Tuna and mackerel . . . .	11,397	8,832	21,113
Herring . . . . .	2,392	1,643	8,881
Other . . . . .	9,756	20,746	44,909
<b>Total production . . . . .</b>	<b>88,021</b>	<b>96,651</b>	<b>235,252</b>
<b>Imports:</b>			
Canada . . . . .	20,875	30,015	54,769
Peru . . . . .	178,856	205,135	348,025
Chile . . . . .	5,128	10,036	12,942
So. Africa Rep. . . . .	1,900	9,538	18,581
Other countries . . . . .	3,099	1,705	4,826
<b>Total imports . . . . .</b>	<b>209,858</b>	<b>256,429</b>	<b>439,143</b>
<b>Available fish meal supply</b>	<b>297,879</b>	<b>353,080</b>	<b>674,395</b>
<b>Fish Solubles:</b>			
<b>Domestic production 2/. . .</b>	<b>34,460</b>	<b>39,025</b>	<b>93,296</b>
<b>Imports:</b>			
Canada . . . . .	915	1,031	1,553
So. Africa Rep. . . . .	-	780	987
Other countries . . . . .	2,315	240	1,965
<b>Total imports . . . . .</b>	<b>3,230</b>	<b>2,051</b>	<b>4,505</b>
<b>Available fish solubles supply</b>	<b>37,690</b>	<b>41,076</b>	<b>97,801</b>
1/Preliminary. 2/50-percent solids.			



## Maine Sardines

### CANNED STOCKS, JULY 1, 1965:

Canners' stocks of Maine sardines on July 1, 1965, were down sharply from those of the same date in 1964 and 1963. But by the end of July 1965, the current season's pack was ahead of that in July 1964.

The new Maine sardine-canning season opened on the traditional date of April 15, 1965, and the pack to August 7, 1965, totaled 689,579 standard cases, as compared with a pack of 409,536 cases for the same period in 1964. Herring landings increased sharply in the last week of July 1965, and the 22 active Maine sardine canneries were packing. Landings continued good into early August. The herring were of good size and excellent quality.

When the new season began on April 15, 1965, there was at the canners' level a carry-over of 290,000 cases. Through July 1, 1965, the 1965 pack season had yielded 241,000 cases.

The new law legalizing year-round canning of Maine sardines will remove the traditional December 1 closing date for the packing season. The new legislation will open winter canning to all Maine sardine packers and will allow winter canning with domestic as well as imported herring.

Final data showed the 1964 pack as 865,751 standard cases (100 cans of 3 $\frac{3}{4}$ -oz.) canned in 23 plants in Maine. That was much less than the 1,619,000 cases packed during 1963, but more than the 754,000 cases packed during the regular season in 1961 when fishing was extremely poor.

Note: See Commercial Fisheries Review, Aug. 1965 p. 43.



## Marketing

### EDIBLE FISHERY PRODUCTS, FIRST HALF 1965:

United States per capita consumption of fishery products during the first half of 1965 dropped below that of a year earlier and retail prices averaged a little higher. Lower domestic landings and smaller stocks of frozen edible fishery products on hand at the beginning of the year contributed to the drop in available supplies.

As the second half of 1965 began, frozen stocks of fishery products were substantially below a year earlier. Fillets and steaks of cod, flounder, ocean perch, and fish sticks and portions were below the same period a year earlier. Except for scallops, frozen stocks of other shellfish products on July 1, 1965, were down.

United States fishery landings are expected to rise seasonally in the third quar-

Canned Maine Sardines--Wholesale Distributors <sup>1</sup> and Canners <sup>2</sup> Stocks, July 1, 1965, with Comparisons 1/											
Type	Unit	1964/65 Season					1963/64 Season				
		7/1/65	6/1/65	4/1/65	1/1/65	11/1/64	7/1/64	6/1/64	4/1/64	1/1/64	11/1/63
Distributors	1,000 actual cases	194	198	236	238	291	234	254	291	261	308
Canners	1,000 std. cases 2/	295	203	314	538	629	514	499	658	1,063	1,255

1/ Table shows marketing season from November 1-October 31.

2/ 100 3 $\frac{3}{4}$ -oz. cans equal 1 standard case.

Source: U. S. Bureau of the Census, Canned Food Report, July 1, 1965.



ter of the year when about 40 percent of the annual U. S. fishery catch for human food will be landed. Shrimp landings in the third quarter will rise seasonally and the catch will probably be above 1964. The 1965 red salmon fishing season is nearly ended; preliminary data show a much larger pack this year than in 1964. Supplies of many other popular fishery products will remain smaller, however, than during July-September 1964. Retail prices of fishery products will likely average a little higher than in 1964.



In the older of the two main sheds of Fulton Fish Market, New York City, journeyman in foreground is transporting a box of salt-water fish to truck for delivery.

According to the U. S. Bureau of Labor Statistics, retail prices for selected fishery products were higher in January-June 1965 than in the same 6 months of 1964. Prices were up 4.7 percent for frozen packaged shrimp (10-oz.); 0.6 percent for fresh or frozen fish; 0.6 percent for canned tuna (6½-oz.); and 4.6 percent for canned sardines (3¼-oz.).

Note: This analysis was prepared by the Bureau of Commercial Fisheries, U. S. Department of the Interior, and published in the Department of Agriculture's August 1965 issue of *National Food Situation* (NFS-113).



## Mississippi

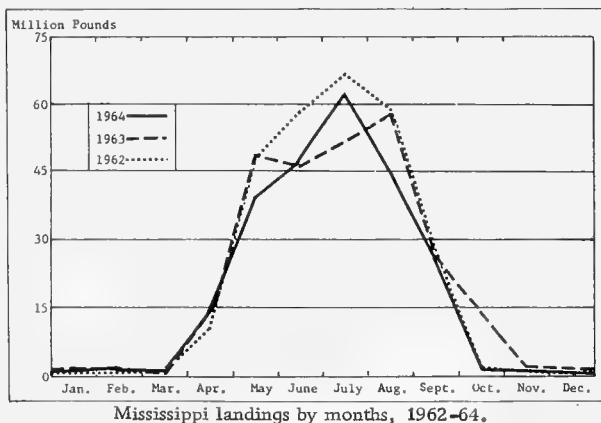
### LANDINGS AND FISHERY TRENDS, 1964:

In 1964, commercial fishermen of the Mississippi Gulf Coast landed 331.9 million pounds of fish and shellfish with an ex-vessel value of \$8.0 million. Compared with the previous year, that was a decline of 3 percent in quantity and 6 percent in value. Menhaden, red snapper, shrimp, oysters, and crab continued to be the leading species in the catch.

**Finfish:** Food fish landings of 3.1 million pounds valued at \$579,000 in 1964 were about the same as in the preceding year. Red snapper was the major item in those landings. Several of the snapper vessels made trips to new fishing grounds in the Caribbean off the coast of Honduras during December 1964. The initial trips had some gear difficulty, but good fishing areas were found.

Industrial fish landings of 316.3 million pounds valued at \$4.5 million made up 99 percent of the total finfish landings in 1964. Otter-trawl industrial landings (78.4 million pounds valued at \$1.3 million) went mainly to petfood canning plants. Menhaden landings (for meal and oil) in 1964 of 237.8 million pounds valued at \$3.1 million were generally at normal levels, although down 5 percent in quantity from the previous year.

The high-volume menhaden fishery is supported by an abundant resource and mechanized equipment. Large-capacity refrigerated vessels using hydraulic blocks for net handling, and large fish pumps to move fish from the purse seine into the hold of the vessel are now standard in the menhaden fleet. Spotter planes work closely with the fleet. The pilot of a spotter plane guides and directs the actual setting of the net from a purse-seine vessel via radio communication. Each menhaden plant now uses two or more spotter planes for their fleet operations.



Mississippi landings by months, 1962-64.

**Shellfish:** Shrimp landings in 1964 of 6.4 million pounds (heads-on weight) valued at \$1.8 million were down 31 percent in quantity and 27 percent in value from the previous year. Catches were down in the summer brown shrimp fishery as well as the fall white shrimp fishery.

Oyster landings of 4.8 million pounds of meats were slightly above the 1963 harvest and represented another good year of production with Mississippi reefs again producing most of the oysters. Oysters landed from Mississippi reefs during the 1964 dredging season were of better quality than the previous year with a subsequent higher yield of meat which increased their value. Raw oyster trade was steady during the year with normal seasonal market fluctuations.

Mississippi Landings, 1964 and 1963				
Species	1964		1963	
Fish	Lbs.	\$	Lbs.	\$
Bluefish. . . .	14,630	1,463	4,600	460
Cabio. . . . .	900	71	2,900	227
Croaker. . . .	500	30	2,600	141
Drum:				
Black. . . . .	45,730	3,060	16,900	1,258
Red or redfish	49,950	7,187	59,000	7,471
Flounders. . .	57,345	7,810	59,300	7,203
Groupers. . . .	268,350	29,302	271,400	29,859
King whiting or kingfish. .	322,960	19,802	256,600	16,077
Menhaden. . .	237,832,600	3,131,440	250,429,200	3,276,215
Mullet. . . . .	249,530	12,391	382,200	19,561
Pompano. . . .	200	100	300	86
Sea Catfish. .	16,650	836	12,700	618
Sea trout:				
Spotted. . . .	148,130	30,522	80,300	20,074
White. . . . .	26,150	1,399	68,200	3,745
Sheepshead. .	49,300	3,847	29,700	2,341
Snapper, Red.	1,849,190	460,872	1,885,800	471,397
Spanish mackerel. . . . .	660	62	1,500	151
Spot. . . . .	7,200	540	4,400	257
Unclassified, Industrial use	78,425,210	1,348,925	72,576,600	1,210,320
Total Fish. . .	319,365,185	5,059,659	326,144,200	5,067,461
Shellfish				
Crabs, Blue:				
Hard. . . . .	1,285,980	81,610	1,112,000	63,633
Soft and peeler. . .	1,700	252	2,700	466
Shrimp, heads-on. .	6,416,024	1,804,829	9,374,700	2,484,195
Oysters. . . . .	4,828,600	1,098,736	4,679,500	975,115
Total shellfish	12,532,304	2,985,427	15,168,900	3,523,409
Grand Total. .	331,897,489	8,045,086	341,313,100	8,590,870

Hard blue crab landings increased for the second consecutive year in 1964 with landings of 1.3 million pounds. A strong demand for crabs throughout the year was a major factor in the increased landings.

Mississippi boatyards were busy during the year with orders for a variety of fishing vessels for local and out-of-State owners.



## National Fisheries Center and Aquarium

### DIRECTOR NAMED BY SECRETARY OF THE INTERIOR:

The appointment of Dr. Warren Jensen Wisby as Director of the new National Fisheries Center and Aquarium planned for Washington, D. C., was announced by Secretary of the Interior Stewart L. Udall, August 23, 1965.

Wisby who assumed his new post in September 1965, has been associated with the



Dr. Warren Jensen Wisby.

University of Miami's Institute of Marine Sciences since 1959 as a researcher, teacher, administrator, and as a designer of its new laboratory building. Concerned primarily with the study of the behavior and sensory physiology of marine organisms, his research projects have included hearing

and color vision in the lemon shark, hearing and allied senses in fish, and behavioral changes in fish resulting from simulated weightlessness. His shark projects and his work in oceanography were subjects of national and local television programs. As a research associate with the University of Wisconsin from 1952 to 1959, he directed graduate students studying the behavior of fresh-water fish and salmon.

The \$10 million National Fisheries Center and Aquarium, scheduled to be built in East Potomac Park by 1968, will be one of the world's largest and most complete installations for exhibiting and studying aquatic life. Operated by Interior's Bureau of Sport Fisheries and Wildlife, it will display in natural surroundings more than 1,000 species of fish, amphibians, and invertebrates. There will be a trout stream, a Gulf bayou, and tanks designed especially for tropical fish and dolphins.

The installation will have facilities and specimens to aid aquatic research in such

diverse fields as fish diseases, behavior of aquatic organisms, nutrition of fish, and medical values of antibiotics produced by marine animals.

The Fisheries Center is distinctive among Federal institutions because it will repay both construction and operational costs by nominal admission charges.

Note: See Commercial Fisheries Review, December 1964 p. 48.



## National Fisheries Institute

### NATIONWIDE PROMOTIONS FOR OCTOBER 1965

#### FISH 'N SEAFOOD PARADE:

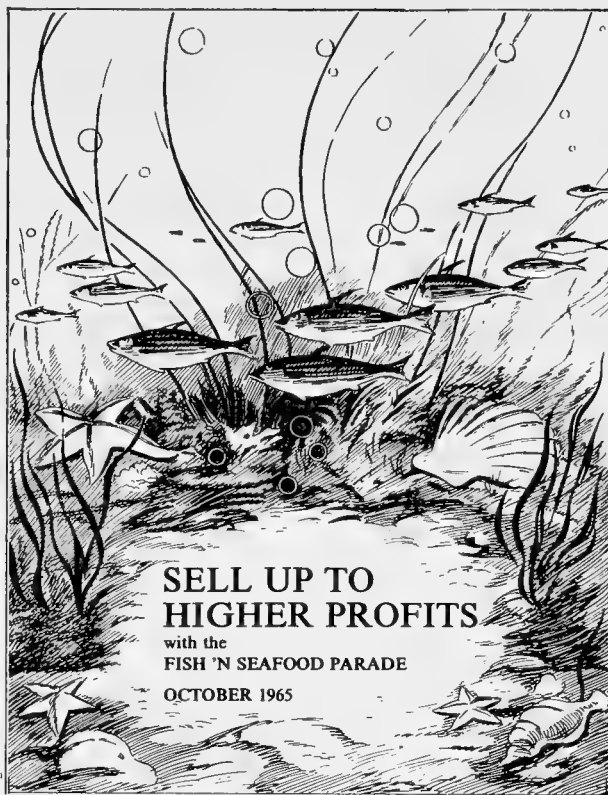
Luncheons and dinners in observance of "Fish 'n Seafood Parade" during October were scheduled in many regions of the United States. Point-of-sale display materials were distributed; local newspaper, radio and TV advertising was scheduled--all to tie in with the annual national campaign sponsored by the National Fisheries Institute (NFI), in cooperation with the U. S. Bureau of Commercial Fisheries.

According to the chairman of the Fish 'n Seafoods Promotions Division of NFI, "The Parade represents a high point in the fishing industry's promotion plans, when it is possible--through the cooperation of many interests--to bring to the consuming public the great varieties of seafoods available today."

Chicago's Seafood Club gave a dinner for press, trade, and industry representatives, at which there was a display of merchandising materials. Actual marketing and merchandising of fishery products were discussed.

Active on the West Coast were northern and southern California groups and the Northwest Fisheries Association. NFI members in northern California formed the Seafood Educational Association. The Association sponsored a buffet luncheon for the press, distributed display materials, and followed through with publicity and advertising in local newspaper and radio media.

The Southern California Fisheries Association's press party was given on October 12 at Cigo's Restaurant in San Pedro. Spe-



Motif being used for the fall 1965 "Fish 'n Seafood Parade."

cial features were a certificate for each guest which could be redeemed for a package of seafood specialties, and a question-and-answer period in which guests answered, "What can our association do to help you know more about seafoods and the fishing industry."

The chairman of Northwest Fisheries Association's Fish 'n Seafood Parade says that their promotion was in four parts: (1) a Fish 'n Seafood Sweepstakes Contest; (2) an in-store-display contest; (3) a kick-off banquet in September; and (4) a promotional campaign in which advertising was scheduled for local newspapers, radio, and television.

In the East and South, Boston, New York City, Philadelphia, Nashville, Atlanta, and Florida cities had Parade activities of their own. The chairman of the Boston group says that their Parade dinner was given at Anthony's Pier 4 on October 4. Guests were members of the press, radio, television, as well as restaurant owners, industry men, and chainstore executives.

The Delaware Valley Fish and Seafood Association, recently organized in Philadelphia,

had held two meetings by early September, according to its chairman. The Association concentrated first on the October Parade. Members intend to make it a continuing organization that will function throughout the year in promoting fishery products.

The Nashville Seafood Association's banquet was scheduled for September 15. The Association expected 115 to 120 guests from the fishing industry, chain stores, restaurants, press, radio, and television. The principal speaker was F. P. Longeway, Jr., general manager of NFI.

Atlanta's Fish 'n Seafood Parade Committee tied in with the Frozen Food Buy-Time Promotion. Those two groups formed the Frozen Food Council of Georgia, according to the U. S. Bureau of Commercial Fisheries marketing representative for Georgia and the Carolinas. The Council's Fish and Seafood Committee intended to buy time on radio and television programs, and purchase point-of-sale displays. Also, the North Carolina Fishermen's Association sponsored a Seafood Editors Conference, October 20-22, in cooperation with the Southeastern Fisheries Association and the State of North Carolina.

Further south, the executive secretary of the Southeastern Fisheries Association reports that chairmen for the Miami, Tampa, and Jacksonville areas of Florida were appointed, and that the Association ordered display materials. The Association's executive secretary said, "We intend to hold some kind of seafood dinner in each of the metropolitan areas of the State during October. These dinners will be in addition to the annual seafood promotion dinner sponsored by the Association."

Notes: (1) For further details write to Fish 'n Seafoods Promotions Division, National Fisheries Institute, 1614 Twentieth Street, NW., Washington, D.C. 20009.

(2) See Commercial Fisheries Review, Aug. 1965 p. 44.



## New England

### REPORT ON ADVANTAGES OF STERN TRAWLING ISSUED BY FEDERAL RESERVE BANK OF BOSTON:

A new technological development applied to commercial fishing in New England may slow or reverse the declining trend of this regional industry, according to a report pub-

lished in the Federal Reserve Bank of Boston's August 1965 Business Review.

A new technique known as "stern trawling," whereby nets and gear are operated from the stern of the vessel rather than from the side as in conventional trawling, may increase the industry's productivity, raise wages and the return on capital, reduce the hazards of fishing, and greatly improve the New England fishing industry's competitive position as against foreign imports of fishery products, the bank said.

In the first of a two-part study of the New England fishing industry, the Boston Reserve Bank reports its study of the 74-foot fishing vessel Narragansett, the first stern trawler in New England's fishing industry. Over a period of nine months, according to the bank's report, this vessel's average catch per trip was more than 70,000 pounds, about 29 percent higher than the average for a comparable group of vessels using the conventional trawling method. In addition, the Narragansett needed only 7 men in the crew as against an average of 9 on side trawlers.

The report said the Narragansett yielded about \$1,731 more in revenue per trip. Its crew members received an average of \$8,350 in wages for the 9 months, compared to an average of \$5,040 for crew members of the side trawlers. It pointed out that "The results of statistical tests indicated that the stern trawling technique made a significant difference in productivity between the Narragansett and the control group vessels."

The report also cited the results of similar experiments conducted by the Department of Fisheries of New Brunswick, Canada, which showed that stern trawlers "were more seaworthy and allowed more rapid handling of the gear. As a result, stern trawlers were on the average able to catch 20 percent more fish per trip." A survey conducted by the bank of foreign owners of stern trawlers confirmed those findings.

The Reserve Bank's questionnaire survey of vessel owners in New England indicated that 60 percent of that region's fishermen feel stern trawlers would be more productive. But the ultimate economic feasibility of stern trawling, the report pointed out, depends on construction costs. A survey of shipbuilders showed that costs for a stern trawler would be about 20 percent higher than for a side

trawler, and this additional cost increases depreciation and interest payments along with the size of the initial down-payment required.

The report concludes with "However, the smaller crew on a stern trawler decreases protection and indemnity insurance costs. Altogether, the stern trawler's higher productivity should offset its higher construction costs, resulting in a greater return on invested capital."

In the second part of the study the Reserve Bank plans to evaluate the 1964 Fishing Fleet Improvement Act as a means of financing this new fishing technology. (Federal Reserve Bank of Boston, August 23, 1965.)



## North Atlantic

### SOVIET FISHING ACTIVITY OFF COAST, AUGUST 1965:

Because Georges Bank was blanketed by dense fog during most of August, aerial observations were restricted and only a limited assessment of Soviet fishing activity was possible. The observations were made by the staff of the Fisheries Resource Management Office, U. S. Bureau of Commercial Fisheries, Gloucester, Mass., which conducts weekly reconnaissance flights cooperatively with the U. S. Coast Guard. It was estimated that in August the Soviet fishing fleet on Georges Bank did not exceed 75 vessels. Of those, 53 were sighted and identified as 19 fish factory stern trawlers, 26 side trawlers, 7 processing and refrigerated transports, and 1 tug. This compares with 100 vessels sighted during their peak in July 1965 and 137 vessels in August 1964.

Soviet fishing operations during the month generally ranged from the Cultivator Shoals to the "southeast part" of Georges Bank, 100 to 150 miles east of Cape Cod. Although most of the vessels were actively engaged in fishing operations, only moderate catches, consisting mostly of whiting, were observed being taken. Toward the end of the month the main Soviet fleet continued to operate in waters adjacent to Nova Scotia and Newfoundland. Those areas are known for their abundance of whiting.

There was no indication that the Soviets were preparing any major emphasis for tak-

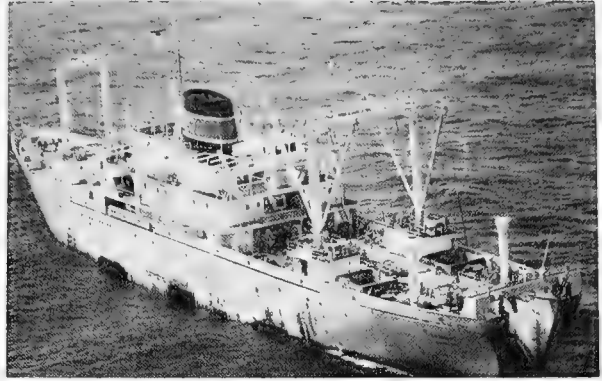


Fig. 1 - Soviet processing factory stern trawler *Grumant* (Skryplev class). Six vessels of this type were operating on Georges Bank during August 1965.

ing herring. It is possible that environmental changes may have delayed the development of that fishery. At about the same time a year earlier, a fleet of about 175 vessels converged on the Georges Shoals area and took very large catches of herring at their spawning stage.

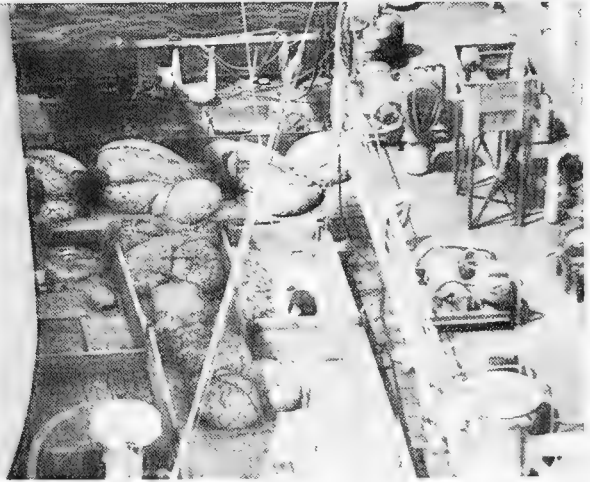


Fig. 2 - Deck view of Soviet processing factory ship *Matochkin Shar* while on Georges Bank. This is one method the Soviets use in handling the fish catch from "Pioneer" class side trawlers. The fish are bundled in sections of netting and then hoisted over the side or pulled in through a stern opening.

In addition to the Soviet vessels, a stern trawler from Poland and another from Romania were fishing on Georges Bank during August.

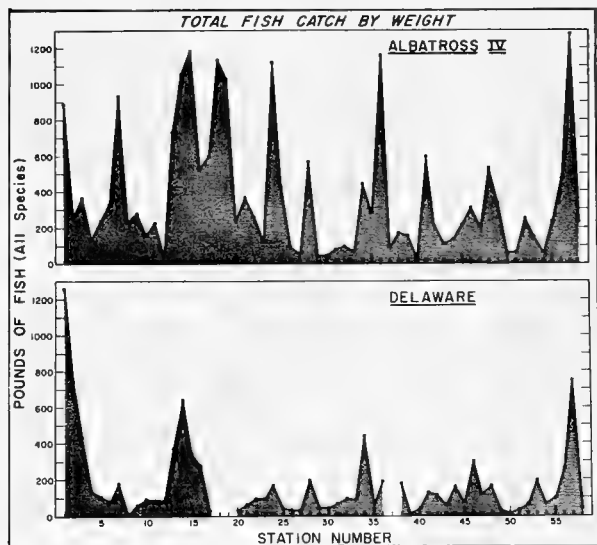
Note: See *Commercial Fisheries Review*, September 1965 p. 34.



## North Atlantic Fisheries Explorations and Gear Development

### SAMPLING EFFICIENCY TESTS OF TWO RESEARCH VESSELS:

M/V "Delaware" Cruise 65-6 (July 8-15, 1965): To compare the sampling efficiency of the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware with that of the Bureau's research vessel Albatross IV was the purpose of this cruise. The Delaware accompanied the Albatross IV for 7 days during the latter vessel's regular summer investigations (Cruise 65-10) in July-August.



Comparison of fish catches during sampling efficiency cruises by M/V Delaware and M/V Albatross IV.

Both vessels occupied a total of 58 fishing stations during this part of the cruise. Each vessel set its gear at approximately the same time and made parallel 30-minute tows, generally within  $\frac{1}{2}$  mile of each other. All fish caught were identified, weighed by species, and measured. Haddock scale samples were taken and fish stomachs were examined from as many stations as possible. All abnormally pigmented blackback flounders were frozen and returned to the Bureau's Biological Laboratory at Woods Hole, Mass. One large white hake weighing 46 pounds and measuring 127 centimeters (50 inches) in length was frozen and returned to the laboratory.

Data obtained on the cruise showed that the Albatross IV caught more fish, by weight, than the Delaware at 80 percent of the stations. Species composition of the Albatross

IV catches was also greater than Delaware catches.



## North Atlantic Fisheries Investigations

### BUREAU OF COMMERCIAL FISHERIES RESEARCH VESSEL HOLDS OPEN HOUSE:

M/V "Albatross IV" Cruise 9 (June 25-27, 1965): The research vessel Albatross IV, operated by the U. S. Bureau of Commercial Fisheries, was open to the public on June 26, 1965, at the Port of Gloucester, Mass., as part of that port's annual "Blessing of the Fleet" celebration. The open house attracted about 700 visitors who were invited to tour the vessel. Various displays were set up for the occasion in the vessel laboratories, and the closed circuit television system with which the vessel is equipped was in operation.

The visitors were interested in looking over the vessel facilities and learning more about the fishery research being done.

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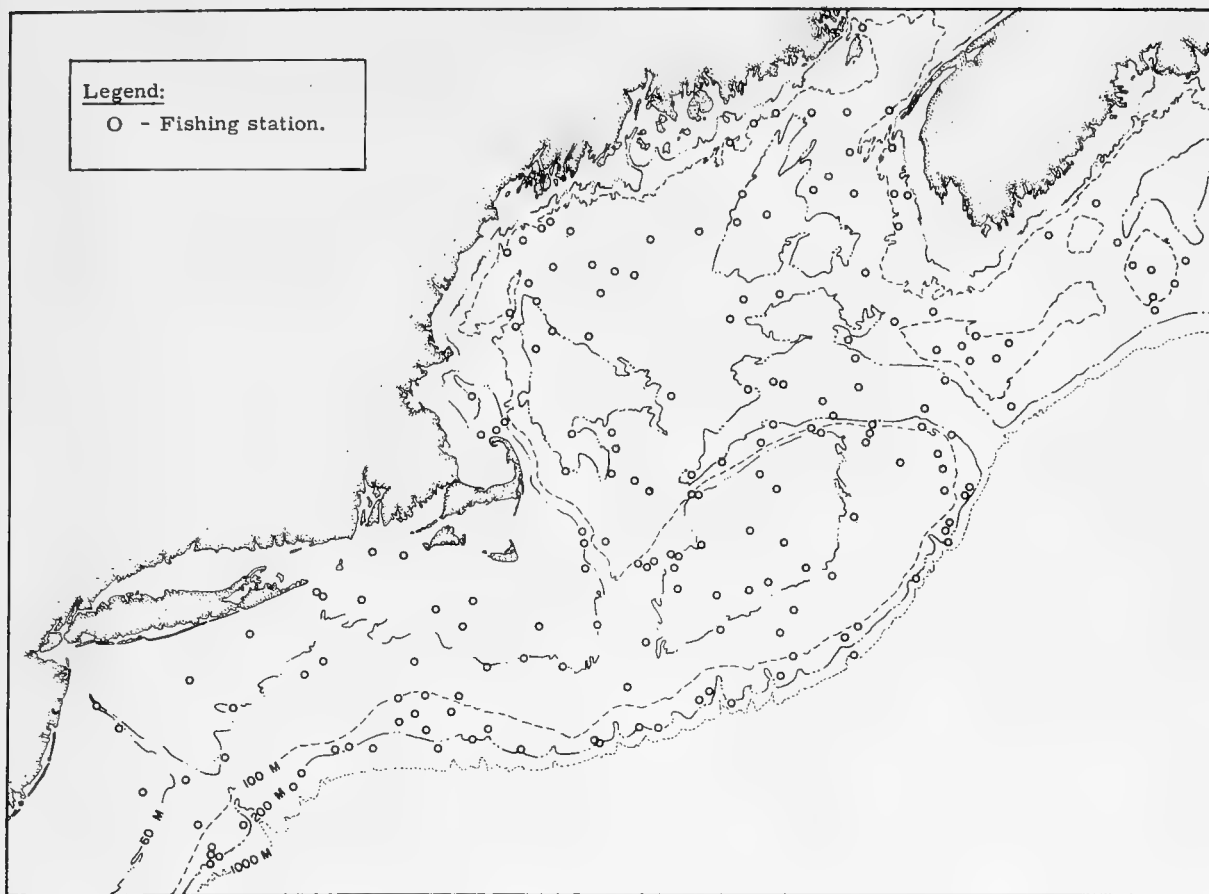
### SUMMER DISTRIBUTION AND ABUNDANCE OF GROUND FISH SPECIES STUDIED:

M/V "Albatross IV" Cruise 65-10--Part I (July 7-21); Part II (July 28-August 10, 1965): To determine the summer distribution and relative abundance of groundfish species from the Bay of Fundy southward to Hudson Canyon was the main objective of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Albatross IV. Another objective was to compare the sampling efficiency of the Bureau's exploratory fishing vessel Delaware with that of the Albatross IV.

The cruise was conducted in two parts. The first part was from the Bay of Fundy southward to include the Gulf of Maine, Browns Bank, and part of Georges Bank. During the first 7 days of the cruise both vessels towed side by side to compare groundfish catches.

A total of 189 otter trawl stations were occupied during the cruise and all fish caught were identified and measured. Other activities included: (1) total weight by species was obtained from each tow; (2) stomach contents of a number of species were examined and recorded; (3) length-weight data from selected species were obtained; (4) scale samples were taken from haddock, yellowtail





Shows fishing stations worked during *Albatross IV* Cruise 65-10 (July-August 1965).

flounder, and silver hake; (5) otoliths were extracted from whiting (silver hake), red hake, and white hake; (6) invertebrates caught in each tow were preserved.

Selected fish species were preserved during the cruise for the collection at Syracuse University, and samples of sea herring were collected for the Bureau's Biological Laboratory, Boothbay Harbor, Me. A number of midwater tows were made with the Isaacs-Kidd trawl, and collections of intestines from selected species were made by personnel from the Massachusetts Institute of Technology in the study of the occurrence of botulism organisms in marine fishes. Bathythermograph casts were made at each station and between stations.

Adult haddock were caught from Georges Bank northward at almost every station in depths less than 80 fathoms, with the largest concentrations of them on Georges Bank. Young haddock were caught with the bottom

trawl in the southern New England area only. Cod were abundant on Browns Bank and at one station off the Maine Coast. Ocean perch were found in deep water throughout the Gulf of Maine, with the largest catch made along the eastern side of Nova Scotia. Whiting (silver hake) were distributed throughout the sampling area in varying numbers. The best catch of that species was in the southern New England area and along the Maine Coast. Good catches of pollock were made at several stations in the Gulf of Maine and on Browns Bank. Spiny dogfish were concentrated on Stellwagen Bank and on Nantucket Shoals.

Tows with the Isaacs-Kidd mid-water trawl were made off Cape Cod, western Nova Scotia, the Northeast Peak of Georges Bank, and around the Hudson Canyon primarily to obtain young-of-the-year haddock. Young haddock between 3 to 7 centimeters (1.2 to 2.8 inches) in length were caught in midwater only around the Hudson Canyon area. Other species such as ocean perch, hake, and butterfish were also taken in mid-water.

On August 7 the vessel docked at Rockland, Me., for the day and had open house to about 1,100 visitors as part of the annual seafood festival.

Note: See Commercial Fisheries Review, November 1965 p. 43.

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#### FISH TAGGING STATISTICS OF WOODS HOLE BIOLOGICAL LABORATORY:

Since the establishment in 1957 of the Tagging Unit at the U. S. Bureau of Commercial Fisheries Biological Laboratory, Woods Hole, Mass., a great many fish and shellfish have been marked and a considerable sum paid out as rewards for the return of tags by fishermen. Some of the Laboratory's statistics on the operation are:

1. A total of 80,576 fish and shellfish (sea scallops) were tagged. The fish species included cod, haddock, winter flounder, fluke, summer flounder, whiting (silver hake), ocean perch (redfish), dogfish, and scup.

2. The greatest number tagged in a single year (1957) was 21,342. The principal species marked was haddock.

3. The greatest number of sea scallops tagged on a single cruise by the Laboratory's research vessel Albatross III (Cruise No. 113, June 1958) was 7,539.

4. Alewife, winter flounder, fluke, and scup were tagged by various State biologists in cooperative programs with the Woods Hole Biological Laboratory. In all, 18,881 fish were tagged on that basis.

5. The Laboratory has been cooperating with the Commonwealth of Massachusetts on a winter flounder tagging program. Over 10,000 fish were marked as of July 1965, of which 2,381 tags were returned by that time.

6. The total amount paid in rewards since 1957 was \$14,479 as of July 1965. The greatest amount in a single year (1964) was \$3,223. For the most part the rewards were paid directly to fishermen by the Bureau's port agents.

7. Fishermen and plant workers of New Bedford, Mass., received the greatest share of reward payments--\$5,012 or 36 percent of the total amount.

8. Every documented return is acknowledged from the Laboratory. The finder is informed about where and when the fish was tagged. Over 11,000 such letters were sent out by the Woods Hole Biological Laboratory since 1957.



### North Pacific Fisheries Explorations and Gear Development

#### MODIFIED PELAGIC TRAWLS BEING TESTED:

M/V "St. Michael" Gear Research Cruise 7 (August-November 1965): The U. S. Bureau of Commercial Fisheries chartered research vessel St. Michael was scheduled to sail from her base at Seattle, Wash., August 5, 1965, for 100 days of pelagic fishing gear research in the waters of Puget Sound and off the coasts of Washington, Oregon, and California.

Principal objectives of the cruise will be to test two modified "Cobb" pelagic trawls and several new telemetering instruments. Both modified trawls are smaller than the full-size trawl presently used in the Bureau's Pacific hake production-type fishing trials. One modified trawl is made of two-inch webbing and one of three-inch webbing. Those nets were designed to reduce trawl drag and gilling of hake.

Several new instruments will be tested during this cruise. A catch load indicator will show the amount of fish in the cod end while the net is being towed; an echo-sounder transducer will be mounted on the trawl headrope; and a mercury switch will turn on a light in the pilothouse when the trawl footrope is a prescribed distance from the bottom. The trawl depth sensors will be connected to the trawl instead of to the hydrofoil trawl boards. Tests will continue on a wireless depth indicator.

The modified "Cobb" pelagic trawls and telemetering instruments will first be tested in Puget Sound. Comparison tows will then be made alongside the chartered trawler Western Flyer, which will be towing a full-size "Cobb" pelagic trawl and using the depth telemetering system with the sensors mounted just ahead of the hydrofoil trawl boards. SCUBA-equipped divers will spend several

days observing the two new modified "Cobb" pelagic trawls to be tested on the cruise.

Note: See Commercial Fisheries Review, February 1965 p. 35.

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#### HAKE POPULATION SURVEY CONTINUED:

M/V "John N. Cobb" Cruise 72 (July-August 13, 1965): To determine the presence and extent of schools of Pacific hake (*Merluccius productus*) off the coasts of Washington and Oregon during July and August was the principal objective of this 6-week cruise by the exploratory fishing vessel John N. Cobb of the U. S. Bureau of Commercial Fisheries. Other objectives included: (1) to record data on the seasonal availability of Pacific hake in Puget Sound collected incidentally to a spiny dogfish (*Squalus acanthias*) collecting effort for the Bureau's Seattle Technological Laboratory; (2) to gain additional data on the catching efficiency of the "Cobb" pelagic trawl; and (3) to obtain biological data on Pacific hake, such as size and sex composition, degree of maturity, food habits, and the presence or absence of hake larvae and eggs.

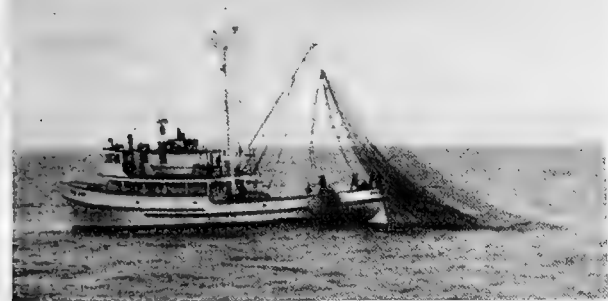


Fig. 1 - M/V John N. Cobb of the U.S. Bureau of Commercial Fisheries hauling in the large pelagic trawl.

Initial plans to survey waters off California were changed to permit intensified coverage between Grays Harbor, Wash., and the Columbia River where the Bureau's chartered research vessel Western Flyer was engaged in commercial-type hake fishing trials.

**GEAR USED:** The principal gear used during the first half of the cruise was a standard Mark II "Cobb" pelagic trawl constructed of 3-inch mesh monofilament webbing. The principal gear used during the second half of the cruise was a standard Mark II "Cobb" pelagic trawl constructed of 3-inch mesh multifilament (12 thread) webbing. Both

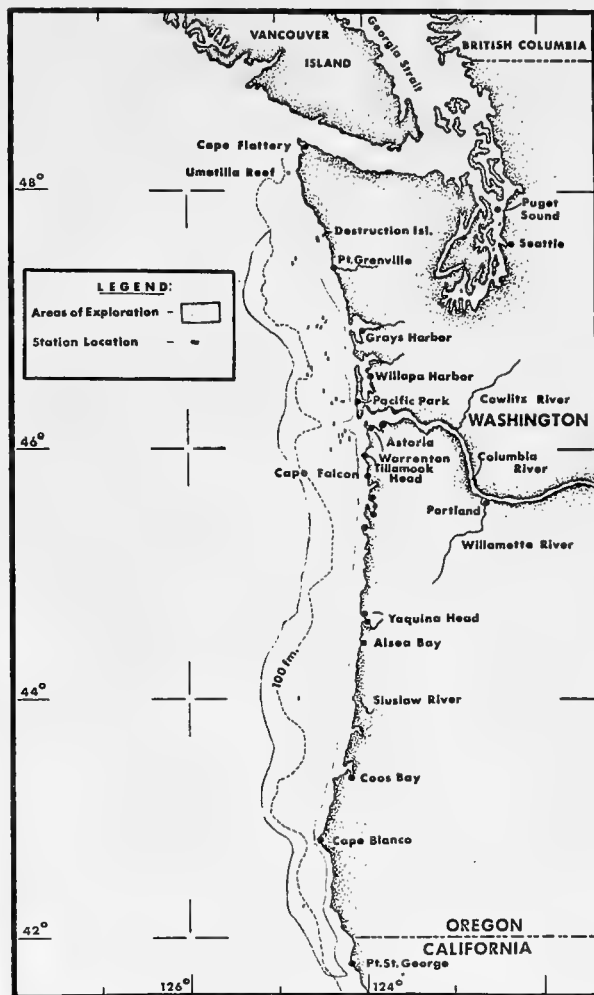


Fig. 2 - Areas of exploration during M/V John N. Cobb Cruise 72 (July 7-August 13, 1965).

trawls were fished with two aluminum hydrofoil-type otter boards on 60-fathom bridles. To facilitate the retention of smaller organisms, both trawls were equipped, on most tows, with a 12-foot marlon liner constructed of  $\frac{9}{16}$ -inch mesh webbing.

Fishing depth of the net was monitored using a dual electrical depth telemetering system having a depth sensing unit housed at the terminus of each electrical towing cable. In addition, a Furuno depth sensing unit was attached to the trawl headrope (4 hauls only); used with a hydrophone the unit similarly permitted a pilothouse read-out of gear depth. A high-resolution, low-frequency echo-sounder was used to locate fish schools. Other gear used included a one-meter plankton net and a 900-foot range bathythermograph (BT).

**METHODS OF OPERATION:** Echo-sounding transects were run in an onshore-off-shore direction at oblique angles to the coast, generally between 200 fathoms and 30 fathoms. When fish traces were observed, closely spaced echo-sounding transects coupled with pelagic trawl hauls were made to determine the size and composition of the schools. Length frequency, maturity, and sex ratio data were obtained from random samples of about 150 hake from each catch. cursory examination of hake stomachs was made to determine types of food organisms. A BT cast was made after each pelagic trawl haul and plankton tows were made at selected localities.

**PELAGIC TRAWLING:** A total of 29 drags was made using the Mark II "Cobb" pelagic trawl in the following areas: Puget Sound (4 drags), off Washington (16 drags), and off Oregon (9 drags).

Although fishing for dogfish was the primary objective in Puget Sound, hake were taken in 2 of the 4 tows. All tows made off Washington and Oregon caught some hake. Catches varied from a minimum of 30 pounds an hour of trawling off Grays Harbor to a maximum of 12,800 pounds an hour of trawling off the northern tip of Oregon. The overall effort showed that 8 tows caught hake at a rate of 10,000 or more pounds an hour--6 off Washington and 2 off Oregon.

Generally, echo-sounding traces off Washington and Oregon were either poor or fair to good when compared to traces observed on previous cruises. The exception was on July 21 while transecting between the 210- and 30-fathom contours just north of the California-Oregon border when excellent traces were observed between 65 and 48 fathoms. Those traces appeared about 6 fathoms above bottom. Due to heavy seas it was not possible to fish the pelagic trawl on that date. Fair echo-sounding traces were observed WNW. of Destruction Island between 86 and 40 fathoms. The area between Destruction Island and Point Grenville, Wash., showed weak traces between 275 and 38 fathoms with occasional fair to good traces centered between the 81 to 46 fathom contours. Sounding transects taken between Grays Harbor and the Columbia River Lightship showed patches of fair to good traces, suggestive of Pacific hake, centered between the 70- to 31-fathom contours. Some good traces appeared at 80 fathoms over a bottom depth of

305 to 130 fathoms due west of Willapa Harbor. Fair traces observed south of the Columbia River were centered between 60 and 55 fathoms. Sporadic traces occurred between 76 and 73 fathoms just north of Tillamook Head, Oreg., with fair to good traces occurring just SW. of Tillamook Head at 58 fathoms. Occasional patches of weak traces appeared between Tillamook Head and Cape Falcon, Oreg. South of Cape Falcon, traces were poor and continued poor to waters off the Siuslaw River, Oreg., where fair traces were observed from 80 to 75 fathoms. Fair traces reappeared 30 miles south of Cape Blanco, Oreg., in 110 to 134 fathoms. In general, echo traces and catches were better north of the Columbia River Lightship than south.

**FISH SIZE, MATURITY, AND STOMACH CONTENTS:** As in previous cruises, hake collected from Puget Sound were smaller than those collected off Washington and Oregon. Samples of male hake collected from Puget Sound, off Washington, and off Oregon ranged in length from 7-20.8 inches, 16.5-25.9 inches, and 14.6-23.2 inches, respectively; female hake collected from those three areas ranged in length from 7.5-23.6 inches, 16.5-25.2 inches, and 16.1-27.2 inches, respectively.

Ovaries examined were limited to various stages of early development. Testes showed a much wider range of development and fully developed multilobed testes with running milt were common.

Stomach contents of Pacific hake were examined from each catch. Stomachs were usually empty and occasionally Euphausiids were observed; pink shrimp or herring were noted rarely. Also, in cooperation with the Bureau's Seattle Technological Laboratory, 10,000 pounds of hake were delivered to a commercial fish company in Warrenton, Oreg., for fillet and fish-fillet block studies. Samples of hake were collected and frozen aboard the vessel for a comparative study of meat firmness relative to different geographic areas.

**Cruise 73:** The M/V John N. Cobb left Seattle, August 30, 1965, on a 5-week exploratory hake-fishing survey along the coast of California. The cruise was to be conducted in cooperation with the Bureau's Seattle and La Jolla Biological Laboratories, Seattle Technological Laboratory, and the California

Department of Fish and Game. The primary purpose was to determine the geographic and bathymetric distribution of schools of hake along the California coast during September. Secondary objectives were to (1) obtain biological data on Pacific hake, and (2) obtain additional data relative to the catching efficiency of the Mark II "Cobb" pelagic trawl.

Note: See Commercial Fisheries Review, September 1965 p. 40.



## North Pacific Fisheries Investigations

### MATURE SOCKEYE SALMON GROWTH AND MORTALITY RATES IN BRISTOL BAY STUDIED:

Over 6,700 sockeye salmon were tagged off the eastern Aleutians by the chartered vessel Yaquina during a cruise from May 21 to July 15, 1965. The vessel, together with the George B. Kelez and the Paragon, was engaged in a U. S. Bureau of Commercial Fisheries study of the growth and mortality rates of Bristol Bay salmon during their last 40 days of ocean life. Data on natural growth and mortality is needed in order to estimate the effect of the extensive Japanese high-seas salmon fishery on the potential yield of the Bristol Bay stocks.

To capture fish for tagging, the Yaquina used a knotless nylon purse seine 400 fathoms long and 30 fathoms deep. At the first fishing station (located south of Dutch Harbor in the North Pacific Ocean), a total of 3,966 sockeye were measured, tagged with Petersen discs, and released. In Bristol Bay, Petersen disc and spaghetti tags were attached to an additional 2,757 sockeye salmon. The major tagging station in Bristol Bay was located northeast of Port Moller where shallow water required modification of the purse seine so it would fish only to 20 fathoms.

Many more sockeye were captured than could be tagged. In 36 sets, over 14,000 fish were taken. The consistently good catches at sea helped forecast the large run to Bristol Bay in 1965.

Note: See Commercial Fisheries Review, July 1965 p. 38.

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### SALMON DROPOUT FROM GILL NETS STUDIED:

M/V "George B. Kelez" and "Paragon" (June-July 1965): To study the dropout of

salmon from gill nets (loss of salmon from high-seas gill nets) was the purpose of this 6-week cruise conducted jointly by the U. S. Bureau of Commercial Fisheries research vessels George B. Kelez and Paragon. The loss of dead or injured salmon from gill nets has long been considered a serious but undetermined source of salmon mortality.



Fig. 1 - M/V George B. Kelez and M/V Paragon in Udagak Bay, Unalaska Island.

Both vessels completed the cruise in mid-July 1965, after fishing broad areas of the North Pacific Ocean south of Unalaska Island, the Bering Sea north of Port Moller, and the near approaches to Bristol Bay. The Paragon devoted its efforts exclusively to the study of dropouts, while the George B. Kelez divided its time between the dropout study and the comparison of returns of tagged gill net- and long line-caught salmon and tag returns from oxygen-treated and untreated salmon.

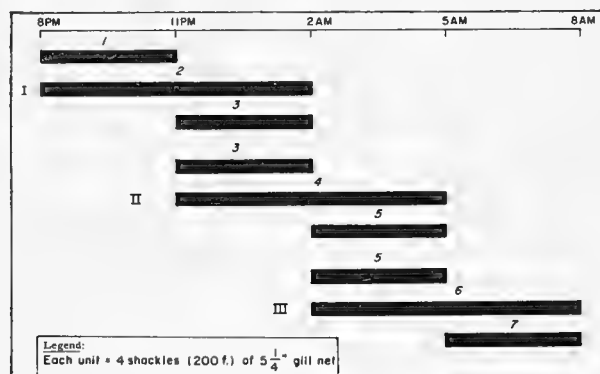


Fig. 2 - Night dropout fishing plan (each unit of gear is identical; length of shaded area refers to fishing time).

Two fishing techniques were used to determine dropout rates. The night fishing plan consisted of fishing units (4 shackles per unit)

of  $5\frac{1}{4}$ -inch mesh gill net over 3 different time periods during the night (fig. 2). The catch of a 6-hour unit when compared with the catches of similar units fished during the first 3-hour portion and the second 3-hour portion of the same period provides an estimate of the dropout rate. A total of 5,134 salmon was taken by 28 night dropout sets made by the two vessels.

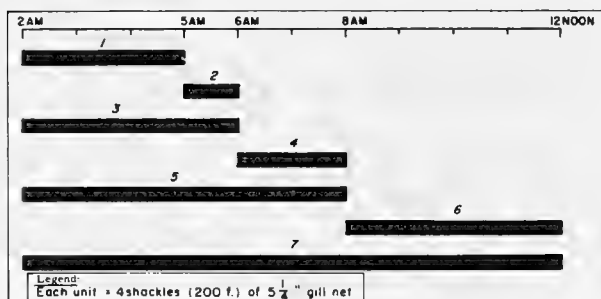
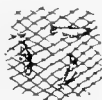


Fig. 3 - Day dropout fishing plan (each unit of gear is identical; length of shaded area refers to fishing time).

The second fishing plan required 4 units of gill net to be set before daylight and fished for varying periods until noon. Additional units were set and fished concurrently for shorter periods (fig. 3). The day dropout sets caught 1,019 salmon.

In each of the two fishing plans the rate of dropout is determined by the discrepancy between the catch of the unit fished continuously and the sum of the catches of the units fished shorter portions of the same period. Analysis of the data, at the Bureau's Biological Laboratory, Seattle, Wash., will take into consideration several variables encountered including sea lion and shark activity along the nets, variation in the abundance of fish, and differences in fishing time, as well as the effect of weather and tide on the nets.



## Oceanography

### NEW NAVAL AIRCRAFT SQUADRON COMMISSIONED TO CONDUCT RESEARCH:

The U. S. Navy on July 1, 1965, commissioned its first aircraft squadron specifically organized to conduct oceanographic research work. This Oceanographic Air Survey Unit, consisting of four C-121 super constellations and one C-54 skymaster, will be based at the U. S. Naval Air Station, Patuxent River, Md. It will be under the technical control of the Commander, U. S. Naval Oceanographic Office.

The use of aircraft in oceanography is not new. In 1953, the Oceanographic Office began using aircraft for its Project Magnet. Those planes have since logged over one-half million survey miles in support of a worldwide magnetic charting program.

Also, a super constellation has been used since 1963 to collect surface temperatures and wave profiles for the Oceanographic Office Antisubmarine Warfare Environmental Prediction System (ASWEPS).

For the third project, known as "Birdseye," planes have been used for about four years in an intensive ice research effort in the Central Arctic Basin. (Newsletter, National Oceanographic Data Center, June/July 1965.)



## Oregon

### SHRIMP FISHERY TRENDS, SUMMER 1965:

The 1965 Oregon shrimp season opened on March 1 and will close on October 31. Shrimp landings in Oregon during the summer of 1965 were running below those in the same period in 1964, probably due to the high percentage of small shrimp in the catch. The appearance of many small shrimp of the 1964 year-class in the 1965 landings may be an indication of good future harvests.

Effective August 2, 1965, the Oregon Fish Commission closed Oregon ports to landings of pink shrimp caught off the northern California coast. The closure was ordered to support the California Fish and Game Department's decision to prevent additional landings of shrimp from a large shrimp bed located just south of the California-Oregon border. The 1965 harvest quota of 1 million pounds of shrimp for that particular bed was fulfilled in late July 1965. The closure did not affect fishing on shrimp beds off the Oregon coast nor landings of Oregon shrimp in Oregon ports. (Oregon Fish Commission, July 29, 1965.)

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### CONSTRUCTION OF NEW WILLAMETTE FALLS FISHWAY TEMPORARILY DELAYED:

Bids received in the summer of 1965 for construction of the first phase of the Willamette Falls fishway were in excess of avail-



able funds and engineering estimates and were rejected by the Oregon Fish Commission. Because of the insufficient time remaining before winter high water at the site, it was decided to postpone any readvertising for bids until early in 1966. In the meantime all planning and construction details will be carefully studied and evaluated in the hope that acceptable bids will be obtained at the later date.

Despite the delay caused by rejection of the bids, engineers of the Oregon Fish Commission feel the ultimate completion date of the entire fishway at Willamette Falls need not necessarily be postponed beyond the original target of 1967.

The new fishway is to be the very latest in modern design in contrast to its predecessor which was first built in 1904 and which, though rebuilt and supplemented over the years, all but failed to pass fall chinook and coho salmon during the low water flows in the Willamette River. With the new fishway, it is believed the potential annual escapement of spring and fall chinook and coho salmon and steelhead in the Willamette could reach 285,000 fish, a dramatic increase over present escapement. The greatest potential increase will be in fall chinook and coho salmon. Millions of fingerlings of those species have already been liberated in the upper Willamette in contemplation of their using the new passage facility on their return as adults. (Oregon Fish Commission, July 27, 1965.)

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#### EXPERIMENTAL LIVE FISH-HOLDING FACILITY FOR LOWER DESCHUTES RIVER:

Construction of an experimental adult fall chinook holding facility near the mouth of the Deschutes River was under way in midsummer 1965, according to the Oregon Fish Commission. The purpose of the installation is to determine the suitability of Deschutes River water for holding adult fall chinook until they mature sufficiently to provide eggs for fish cultural purposes. The facility was expected to be in operation by August 12, 1965, to assure accommodation of the 1965 fall chinook run. Urgency of the project was based on the expected completion of the John Day Dam in 1968 with subsequent flooding out of main stem spawning areas used by as many as 60,000 fall chinook each season.

The results of this initial operation on the Deschutes will be used to guide future planning for handling fish in the area. The fisheries agencies cooperating in the project, which will be operated by the Oregon Fish Commission, include the Washington Department of Fisheries, Washington Department of Game, Oregon Game Commission, and the U. S. Fish and Wildlife Service. Those agencies have recommended jointly that the Corps of Engineers provide artificial propagation facilities as mitigation for the loss of the fall chinook spawning area in that portion of the main stem Columbia River to be flooded by the John Day Dam. The Corps is financing the study. A site for the experimental ponds on the east bank of the Deschutes just upstream from the U. S. Highway 30 bridge was provided by the Oregon Parks and Recreation Division of the State Highway Department.

The Director of the Oregon Fish Commission said that before any sizable investment is made in a production facility it is essential that the feasibility of holding adult fall chinook in Deschutes River water be thoroughly investigated. During recent years water temperatures as high as 69° F. have been recorded from the lower Deschutes during late summer. Optimum temperature for holding fall chinook is considered to be about 55° F., but falls have been successfully held at considerably higher temperatures. It was pointed out that with a substantial number of fall chinook flooded out of their usual spawning areas, it becomes necessary to handle the fish in the best manner possible to keep from losing that segment of the run. Artificial propagation appears to offer the best solution to the situation in the opinion of the cooperating agencies.

The temporary experimental installation will consist of 4 holding tanks, each measuring 10 x 30 x 7 feet deep, each with two 4 x 10 feet sorting tanks of varying depth. The tanks will have wooden sides and 2-inch thick concrete floors. Two of the holding tanks will be operated with a continuous flow of Deschutes River water and 2 will be provided with recirculated Deschutes water which will be filtered and cooled to maintain a constant 55° F. temperature. Each pond will hold 100 adult fall chinook taken for the purpose from the fishway at The Dalles Dam.

When the eggs ripen in the fall they will be stripped from the fish at the facility and shipped for incubation and eventual rearing

to the Oregon Fish Commission's experimental Pelton hatchery. Some will also go to the U. S. Fish and Wildlife Service's hatchery on Abernathy Creek, Wash., where they will be hatched and the fingerlings reared to liberation size.

The problem is a critical one, the Commission director stated. All of the State and Federal fish and game agencies in the area are dedicated to finding a workable solution to the problem of perpetuating this important segment of the fall chinook population. (Oregon Fish Commission, Portland, August 2, 1965.)



## Oysters

### MARYLAND OBSERVATIONS FOR 1965:

An August 12, 1965, bulletin issued by the Chesapeake Biological Laboratory (Solomons, Md.) of the University of Maryland Natural Resources Institute, gives the following report of oyster growth and related data for the Maryland portion of the Chesapeake Bay:

The 1965 Spatfall: The monitoring of spatfall continued in 1965 the same as in 1964 using transite plates as sample cultch. The program was expanded somewhat to include extra stations in the Potomac River, Tangier Sound, and the Severn River.

The setting began earlier than usual in 1965. In the upper St. Marys River, spat were recorded as early as June 8, whereas a year earlier in the same location no spat were found until June 25. Another interesting phenomenon which occurred in some of the higher setting areas was a bimodal setting pattern in which a strong wave of setting during the week of June 8-15 was followed by a slump and then two weeks later setting resumed heavier than ever. The Choptank River area and the upper St. Marys River both show that pattern.

The spat seemed to be setting well in the major seed areas--Tar Bay, Eastern Bay, and the St. Marys. However, very little setting was observed in the Potomac River, and Holland Straits was also failing to show any substantial spatfall again.

The U. S. Bureau of Commercial Fisheries Laboratory at Oxford, Md., again record-

ed spatfall in the Tred Avon River, Harris Creek, and Irish Creek.

Summary of 1964 Spatfall: The last spatfall recorded by the Chesapeake Biological Laboratory occurred during the week of September 23, 1964, in the Manokin River. There was no substantial setting monitored after the first week in September, and most of the peaks appeared to occur in late July and early August.

Survey: The yearly fall oyster bar survey by the Department of Chesapeake Bay Affairs with the cooperation and assistance of the Chesapeake Biological Laboratory began in October 1964 and continued through the end of the year into January 1965. A total of 730 samples of bottom material were taken, each sample consisting of  $\frac{1}{2}$  Maryland oyster bushel. The majority of the samples were obtained from seed or shell plants but some natural rocks were also examined. It was assumed that most of the spat in the areas surveyed had attained enough size to be clearly visible (in one month a spat can grow large enough to be easily seen) but some of the late setting spat were probably missed, since growth slows down and finally stops as the water temperature approaches 41° F. Spat which set too late in the season to grow appreciably before they are forced to stop feeding by the onset of low temperatures are often mistaken for "winter set" when they are discovered the following spring on boat hulls, etc.

The previous year the seasonal spatfall accumulations as determined by the survey were averaged by areas and listed on a diagram of the Maryland oyster-producing area. Since that method of summarizing the survey insofar as it dealt with seasonal spatfall seemed fairly effective it was repeated this year, and the two diagrams make an interesting comparison. The year 1964 was a good setting year in many areas and even seemed to equal or exceed 1963 in such places as Eastern Bay, Tar Bay, and Hooper Straits. Some areas such as the Wicomico on the Potomac and the South River reverted back to their typical low counts after an exceptionally good set in 1963.

Notes: (1) For more detailed data write to the Chesapeake Biological Laboratory, Natural Resources Institute, University of Maryland, Solomons, Md. ("Report of Maryland Oyster Observations for 1965," Ref. No. 65-60, August 12, 1965.)

(2) See Commercial Fisheries Review, October 1964 p. 34.



## Salmon

### BRANDING TECHNIQUE TESTED ON ALASKA SOCKEYE SALMON:

To aid migration studies, some Alaskan salmon are now being branded like cows. Serial numbers are burned on the fish with a rod heated in water. The new technique was used on young sockeye salmon in Alaska for the first time in the summer of 1965. Initial field tests were made at the Brooks Lake Biological Field Station of the U. S. Bureau of Commercial Fisheries. The brand consisting of numbers and letters is made with a metal rod (silver tip on copper) heated in boiling water and applied for approximately one second much like the hot iron used in branding cattle. The brand remains legible on the fish up to 18 months.

The salmon branding technique was developed under the Fish-Passage Research Program of the U. S. Bureau of Commercial Fisheries and has been used in various studies in the Columbia and Snake Rivers.

Finding a suitable tag or mark to identify fish in research has been a challenging problem for fishery biologists. Various types of tags and fin-clip marks have been used. But scientists have expressed concern that adding tags or clipping fins may interfere with swimming movements of fish. The new branding technique does not add any weight to the fish, nor does it remove any fins. The initial success with branding opens possibilities for future and even more extensive use.

Note: See Commercial Fisheries Review, March 1963 p. 60.

\* \* \* \* \*

### POLLUTION THREAT REDUCED IN WILLAMETTE RIVER:

Emergency water releases from power dams plus reduced waste disposal by mills may have saved the fall run of chinook salmon in Oregon's Willamette River--but the pollution danger is far from ended. That was the situation on the Willamette in late August 1965, according to the Director of the Columbia River Program Office of the U. S. Bureau of Commercial Fisheries. He said fall chinook salmon were passing over Willamette Falls at Oregon City in good numbers, indicating "that the reduction in pollution resulting from recent emergency measures has increased the oxygen in the Willamette enough to sustain fish life."

As of August 27, 1965, the daily low oxygen reading had risen to 6 parts per million at Oregon City and 3 parts per million in Portland Harbor, as compared to readings of 3.7 and 1.6, respectively, when the pollution crisis was at its height earlier in August. Such low readings, if continued over an extended period, could have destroyed all the fish in the river.

"The improvement is due to the willingness of the Army Engineers in cooperation with Bonneville Power Administration (BPA) to release water from the electric power storage supply prematurely and also to the mills' reducing their effluent output," the Director of the Columbia River Program said. "We are grateful to BPA, the Engineers, and the mills for their efforts."

But he cautioned that the danger to the fish runs in the polluted Willamette has not been eliminated, even temporarily, and "there is no ground for any relaxation in our attempts to keep the river clean and safe." He pointed out that September is traditionally a month of high pollution in the Willamette and any slackening of pollution control would be very dangerous.

"We are still striving to reach a minimum level of 5 parts per million in Portland Harbor to assure safe passage of the fish there," he said.

The Secretary of the Interior has warned that the releases of clean water stored for power and other purposes must not be counted upon as a substitute for adequate pollution control.



## Shrimp

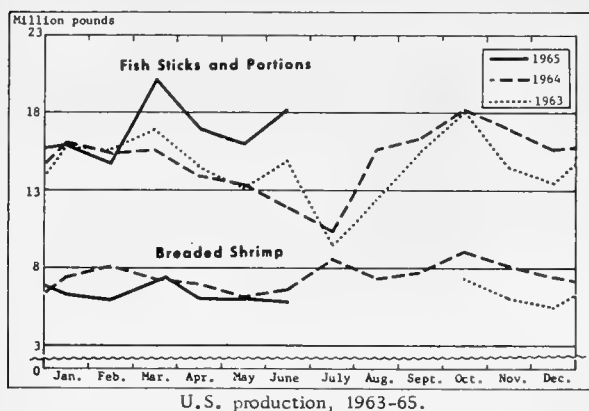
### BREADED PRODUCTION, APRIL-JUNE 1965:

United States production of breaded shrimp during the second quarter of 1965 amounted

Table 1 - U. S. Production of Breaded Shrimp by Areas, April-June 1965

Area	1/Apr.-June 1965		Apr.-June 1964	
	Plants	Quantity	Plants	Quantity
	No.	1,000 Lbs.	No.	1,000 Lbs.
Atlantic . . . .	14	5,938	14	6,335
Gulf . . . . .	16	10,167	21	11,574
Pacific . . . . .	7	1,893	8	1,877
Total . . . .	37	17,998	43	19,786

1/Preliminary.



to about 18.0 million pounds--a decrease of about 1.8 million pounds or 9.0 percent as compared with the same period in 1964.

Table 2-U. S. Production of Breaded Shrimp by Months, 1964-65

Month	1/1965	1964
	. . (1,000 Lbs.). .	
January . . . . .	6,901	7,347
February . . . . .	6,613	8,045
March . . . . .	7,742	7,249
April . . . . .	6,120	7,027
May . . . . .	6,023	6,171
June . . . . .	5,855	6,588
July . . . . .	-	8,641
August . . . . .	-	7,299
September . . . . .	-	7,830
October . . . . .	-	9,169
November . . . . .	-	7,852
December . . . . .	-	7,460
Total . . . . .	-	90,678

1/Preliminary.

The Gulf States ranked first in the production of breaded shrimp with 10.2 million pounds, followed by the Atlantic States with 5.9 million pounds, and the Pacific States with 1.9 million pounds.



## South Atlantic Fisheries

### Explorations and Gear Development

#### LONG-LINING FOR SWORDFISH IN BAHAMA AREA TESTED:

M/V "Oregon" Cruise 102 (July 14-30, 1965): Preliminary investigations to assess the availability of swordfish (*Xiphias gladius*) were continued during this 18-day exploratory long-line fishing cruise by the U. S. Bureau of Commercial Fisheries research vessel Oregon. The cruise covered the surround-

ing areas of Grand Bahama, Abaco, and Eleuthera Islands in the Bahamas and along the Continental Shelf off the Florida coast.

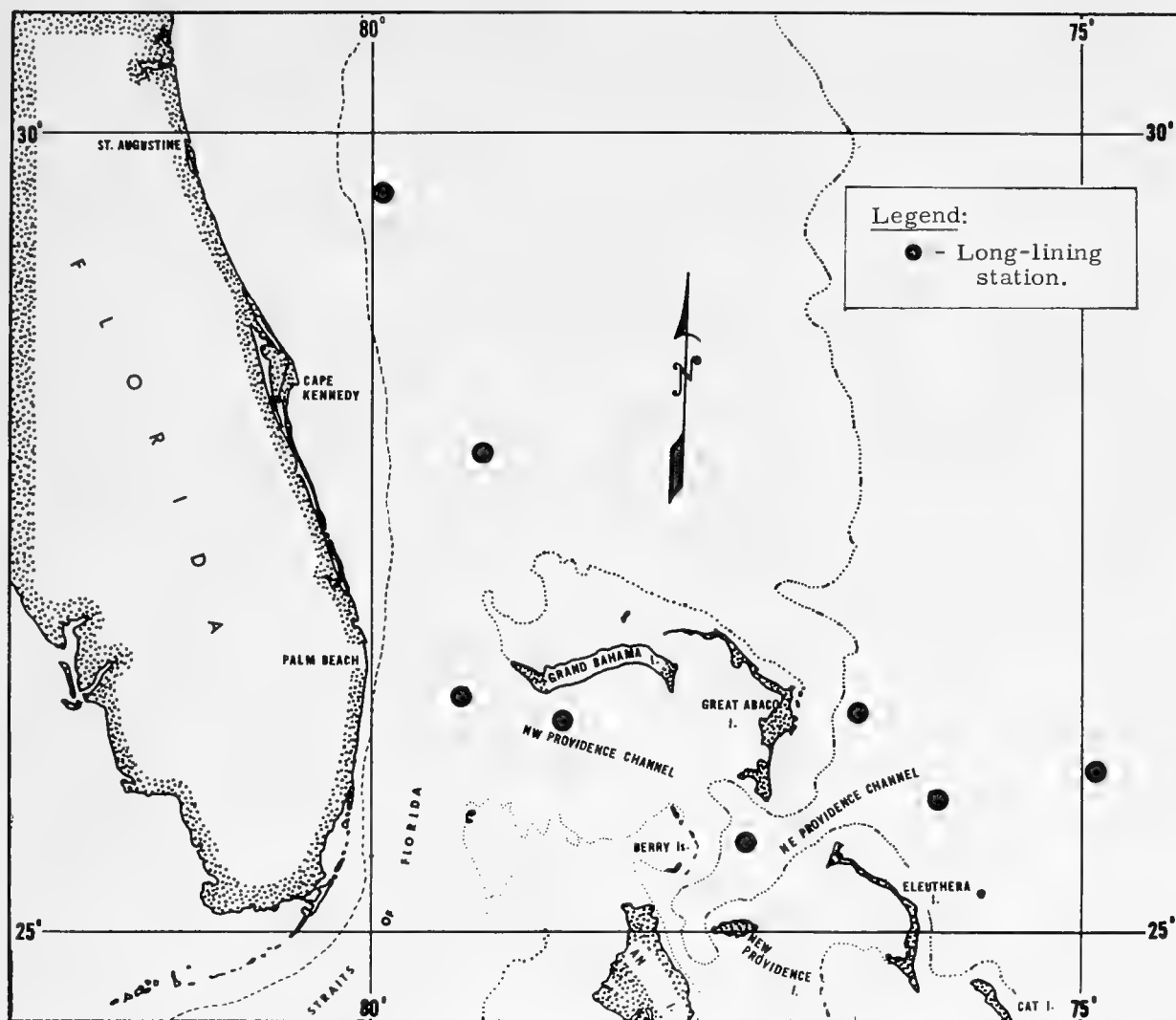
A total of 9 long-line sets (4,300 hooks) in the area covered yielded 17 swordfish. Four sets (2,000 hook total) east of Great Abaco Island and Eleuthera Island where surface water temperatures registered 83° F. yielded 3 swordfish. One 300-hook set in Northeast Providence Channel accounted for one swordfish.

A 500-hook set in Northwest Providence Channel yielded 3 small swordfish weighing 35, 27, and 52 pounds, respectively. Surface water temperature in that area also registered 83° F. Another 500-hook set along the eastern edge of the Straits of Florida east of Palm Beach brought negative results. Forty-two miles north of Matanilla Shoal along the Continental Shelf a 500-hook set yielded 2 swordfish. The heaviest concentration of sharks (22 captures) during the entire cruise was encountered in that area.

The most promising fishing area of the cruise was 70 miles east of St. Augustine between 271 and 351 fathoms in surface water of 84° F. A 500-hook set with 10- and 20-fathom buoy-line drops and baited with frozen squid and Spanish mackerel ( $\frac{3}{4}$  to 1 pound) yielded 6 swordfish (round weight 559 pounds).

Incidental catches of blue marlin (*Makaira nigricans*), sailfish (*Istiophorus* sp.), yellowfin tuna (*Thunnus albacares*), big-eyed tuna (*Thunnus obesus*), blackfin tuna (*Thunnus atlanticus*), barracuda (*Sphyraena* sp.), and dolphin (*Coryphaena* sp.) were made throughout the cruise. Shark damage was negligible.

The exploratory long-line swordfish fishery technique followed a pattern of setting 500 hooks shortly after sunset and allowing the gear to soak throughout the night for about 10 hours. Retrieval of the line commenced at daybreak and continued on an average of 3-4 minutes a basket depending on the amount of fish on the line. The gear is a standard basket of 10 hooks, spaced 12 fathoms apart with 3-fathom gangions and an additional 1-fathom stainless steel leader. Buoy drops varied in length from 10 to 30 fathoms. A breakdown of the drops is as follows: 1,860 hooks (43 percent) at 10 fathoms; 2,090 hooks (46 percent) at 20 fathoms; and 350 hooks (11 percent) at 30 fathoms.



Station pattern of M/V Oregon Cruise 102 (July 14-30, 1965).

Fresh-frozen baits were used exclusively throughout the cruise as follows: 3,470 hooks of mackerel ( $\frac{3}{4}$  to 1 pound size) and 830 hooks of squid.

Of the total 17 swordfish caught, 76 percent (13 fish) were taken on the 20-fathom drops. A breakdown of the catch by dropbait is as follows: Ten-fathom squid (800 hooks) 1 fish; mackerel (1,060 hooks) 2 fish. Twenty-fathom squid (330 hooks) 2 fish; mackerel (1,760 hooks) 11 fish. Thirty-fathom mackerel (350 hooks) 1 fish.

Total weight of the swordfish caught was 1,401 pounds. This includes an estimated weight of 80 pounds for the one shark-dam-

aged fish of the entire cruise. Individual weights of the swordfish ranged from 18 to 162 pounds. Five of them weighed over 100 pounds each; another 5 weighed from 75 to 100 pounds; and the remaining 7 fish weighed under 75 pounds each. All swordfish were measured, sex was determined, and stomach contents were examined, with all data recorded for future study.

In addition to the exploratory long-lining, other activities during the cruise were: (1) 9 nekton and 5 dip-net stations were occupied for the collection of juvenile and larval species; (2) 15 bathythermograph (BT) casts were made; (3) in cooperation with the Woods Hole Oceanographic Institute, 120 drift bottles and

170 seabed drifters were released along the Continental Shelf; (4) 5 sharks were tagged (4 dart and 1 disc) and released for the Shark Tagging Program of the American Institute of Biological Sciences.

During all daylight hours whenever the vessel was steaming, 4 trolling lines were set with the following results: 4 dolphin (*Coryphaena hippurus*), 4 barracuda (*Sphyraena barracuda*), 2 king mackerel (*Scomberomorus cavalla*), 1 rainbow runner (*Elagatis bipinnulus*), 1 yellowfin tuna (*Thunnus albacares*), 1 blackfin tuna (*Thunnus obesus*), and 1 big-eyed tuna (*Thunnus abesus*).

The Oregon was scheduled to start another cruise on September 13 as part of a continuing assessment of the marine resources of waters of interest to the U. S. fishing fleets. It will be conducted in cooperation with the United Nations Special Fund Caribbean Program and will have as primary objectives investigation of benthic fish and shellfish and pelagic long-line tuna and swordfish potentials in the southern Caribbean. A portion of the long-lining on this later cruise will be conducted in cooperation with the Bureau's research vessel Geronimo.

Note: See Commercial Fisheries Review, September 1965 p. 43; July 1965 p. 47.



## Tuna

### GULF OF GUINEA SURVEY CONTINUED:

M/V "Geronimo" Cruise 5 (January 17-May 18, 1965): To make tuna surveys and current measurements in the Gulf of Guinea was the main purpose of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Geronimo. This was the fourth cruise of the Geronimo to West Africa to participate in cooperative international studies of the tropical Atlantic. The Geronimo's Chief Scientist on the cruise said the vessel's latest expedition was successful in accomplishing two main objectives: (1) further measurement of a heretofore unknown ocean current in the Gulf of Guinea, and (2) confirmation of hypotheses about the distribution of tuna schools off West Africa.

The first mission of the cruise designated Tuna Survey V, was carried out February 10-March 2, 1965, off the coast of Sierra Leone and Liberia to survey the distribution of tuna

schools and of properties of the environment during the "upwelling" season offshore. A total of 84 tuna schools was observed, and samples of tuna were caught from 16 of them, using live bait.

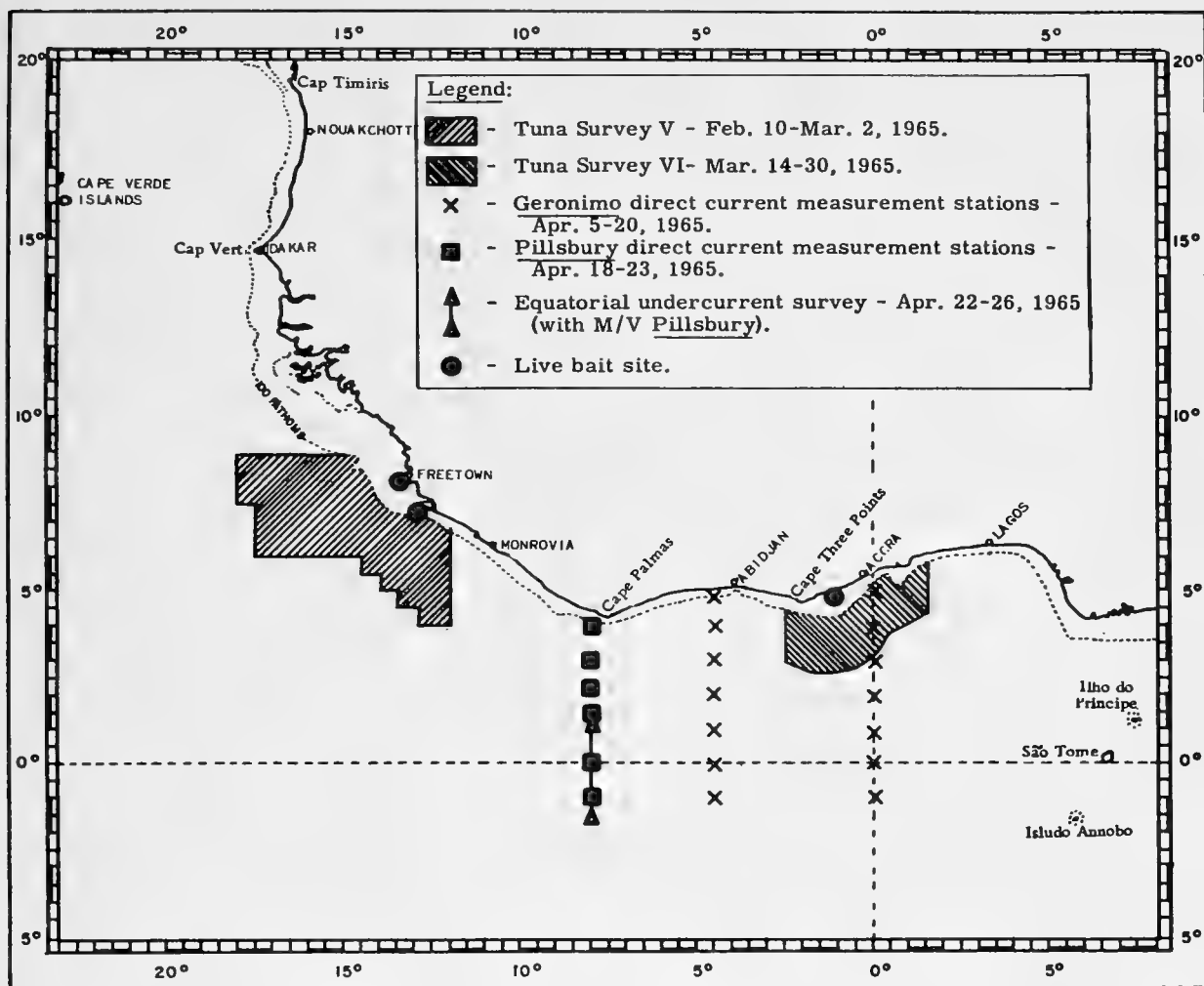
The second mission of the cruise, designated Tuna Survey VI, was carried out south of Ghana and Togo, March 14-23 and 26-30, 1965. A total of 137 tuna schools was observed, and samples of tuna were caught from 23 of them.

The third mission of the cruise involved current studies and was carried out April 5-26, 1965, in the Gulf of Guinea. A total of 14 direct current-measurement stations was occupied. Preliminary results from parachute drogue tracking further confirmed the existence of the westward-flowing Guinea Undercurrent.

**TUNA SURVEY V:** Preliminary studies of the surface fishery and the environment off the coast of West Africa have indicated that concentrations of tuna schools are associated with an oceanographic front off the Senegal-Liberia coast. This front develops during the northern hemisphere winter months. It forms the boundary between cold, recently upwelled water to the north, and warmer, less saline water of Guinean origin to the south. A total of 22 north-south, 90-mile transects was run in the area just south of the front. Throughout the area, oceanographic and biological observations designed to provide information descriptive of the environment were made. Observations of the 84 tuna schools encountered included attempts to sample them, using live-bait fishing. Samples were obtained from 16 of the schools. By far the majority of the schools were skipjack of a small size, 5-7 pounds.

A dense concentration of large schools of skipjack was found on February 26, approximately 90 miles south of the location of the front. It would appear that the front itself does not act as a physical barrier to the migration of the tuna, but acts instead as a mechanism for producing increased food. The final maturation of concentrations of food, which may result in concentrations of tuna, could occur some distance from the front itself. In an attempt to obtain samples of the entire spectrum of food available to tuna, a high-speed Neuston net was towed through feeding tuna schools. Food samples also were taken from tuna stomachs.





M/V Geronimo Cruise 5 area of operations off West Africa (January 17-May 18, 1965).

**TUNA SURVEY VI:** A similar pattern of daily 90-mile transects was followed during Tuna Survey VI, carried out offshore from Ghana and Togo. During 15 transects, a total of 137 tuna schools was seen, and 23 samples of tuna were obtained. Virtually all of the schools encountered were made up of small yellowfin and skipjack, 5 to 7 pounds.

In general, those schools were most abundant in the western part of the survey area. Following the initial 10 transects, a repeat survey was made in the area where schools were most abundant. The distributional pattern of the repeat survey indicated that the area of greatest density of schools had moved westward.

**CURRENT METER PROGRAM:** At each of the 14 direct current measurement sta-

tions, a reference buoy was anchored to the bottom and a lowering of a Savonius rotor was made to determine the depth of a subsurface current velocity maximum. A surface drogue and a drogue at the depth of the velocity maximum were then released and tracked by radar. At each station, lowerings were made to a depth of 500 meters (1,640 feet) with a recording current meter. In addition, a Nansen cast, productivity station, meter net tow, and Clarke-Bumpus haul were made.

Drogue results indicated the westward-flowing south equatorial surface current in the vicinity of the Equator, the eastward Guinea surface current to the north, the eastward-flowing Atlantic Equatorial Undercurrent, and the westward-flowing Guinea Undercurrent below the Guinea surface current.

Detailed study of velocity profiles will be made after analysis of the data from current meter lowerings.

Three transects (31 hydrographic stations, including lowering of a temperature-salinity-depth probe) were made between latitude 1°30' N. and 1°30' S., at longitude 8° W. At the same time the oceanographic research vessel John Elliott Pillsbury monitored changes in the undercurrent at the equator.

Note: See Commercial Fisheries Review, July 1965 p. 40; Jan. 1965 p. 43; Nov. 1964 p. 57.



## United States Fisheries

### COMMERCIAL FISHERY LANDINGS, 1965:

Total Landings: The U. S. catch of fish and shellfish in 1965 (mostly for the first 7 months and in some instances various periods through August 27) was down about 18 million pounds (or 1 percent) as compared with the same period in 1964.



Fig. 1 - Brailing red salmon from gill net boat to buying scow in Bristol Bay, Alaska.

Salmon: On the basis of the reported pack of canned salmon, it was estimated that the Alaska catch to August 22 was about 273 mil-

lion pounds--a decline of 16 million pounds compared with 1964. The catch of pinks was down, although red salmon landings were up substantially.

United States Commercial Fishery Landings of Certain Species for Periods Shown, 1965 and 1964				
Species	Period	1/1965	1964	Total 1964
. . . . (1,000 Lbs.) . . . .				
<b>Cod:</b>				
Maine . . . . .	6 mos.	1,600	1,385	2,400
Mass. 2/ . . . . .	7 "	16,500	17,134	29,504
Total cod . . . . .		18,100	18,519	31,904
<b>Flounder:</b>				
Maine . . . . .	6 mos.	900	666	1,152
Mass. . . . .	7 "	53,900	53,070	96,622
Total flounder . . . . .		54,800	53,736	97,774
<b>Haddock:</b>				
Maine . . . . .	6 mos.	700	1,348	2,948
Mass. 2/ . . . . .	7 "	69,500	78,814	114,261
Total haddock . . . . .		70,200	80,162	117,209
<b>Halibut 3/:</b>				
Alaska . . . . .	7 mos.	16,600	12,689	17,064
Wash. and Oreg. . . . .	7 "	4,200	6,241	9,322
Total halibut . . . . .		20,800	18,930	26,386
<b>Herring, Maine . . . . .</b>	6 mos.	19,800	10,224	60,866
<b>Industrial fish (Maine and Mass.) 4/ . . . . .</b>	7 mos.	42,600	18,540	32,391
<b>Mackerel:</b>				
Jack 5/ . . . . .	to Aug. 27	33,100	46,268	89,618
Pacific 5/ . . . . .	to Aug. 27	800	12,008	26,828
Menhaden . . . . .	7 mos.	979,900	956,196	1,566,800
<b>Ocean perch:</b>				
Maine . . . . .	7 mos.	33,800	30,762	58,936
Mass. . . . .	7 "	12,100	18,322	30,332
Total ocean perch . . . . .		45,900	49,084	89,268
<b>Pollock:</b>				
Maine . . . . .	7 mos.	300	630	1,312
Mass. 2/ . . . . .	7 "	3,500	5,607	10,558
Total pollock . . . . .		3,800	6,237	11,870
<b>Salmon, Alaska . . . . .</b>	to Aug. 22	272,800	288,830	312,000
<b>Scallops, sea, New Bedford (meats) . . . . .</b>	7 mos.	6,400	8,125	12,930
<b>Shrimp (heads-on):</b>				
So. Atl. . . . .	7 mos.	8,200	5,365	17,400
Gulf . . . . .	7 "	93,700	80,770	179,000
Tuna, Calif. . . . .	to Aug. 21	168,800	192,726	280,765
<b>Whiting:</b>				
Maine . . . . .	6 mos.	3,200	4,888	25,304
Mass. . . . .	7 "	18,600	26,772	57,361
Total whiting . . . . .		21,800	31,660	82,665
Total all above items . . . . .		1,861,500	1,877,380	3,035,674
Other 6/ . . . . .		333,700	336,001	1,487,326
Grand total . . . . .		2,195,200	2,213,381	4,523,000
1/ Preliminary. 2/ Landed weight. 3/ Dressed weight. 4/ Excludes menhaden. 5/ Cannery receipts. 6/ Includes landings for species not listed. Note: Finfish generally converted to round weight, crustaceans to weight in the shell, and mollusks reported in meats only.				

Tuna: Landings in California to August 21 totaled about 169 million pounds--down 24 million pounds compared with the same date

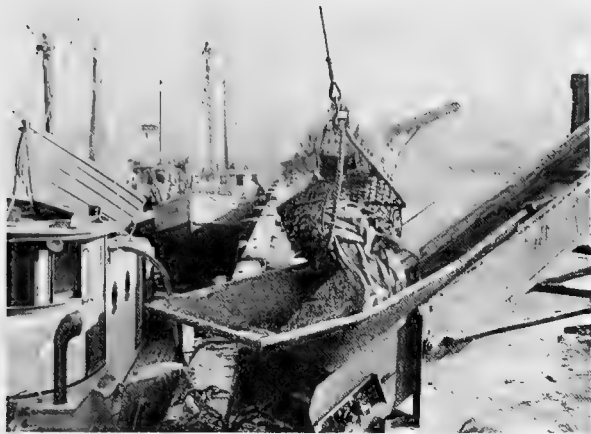


Fig. 2 - Unloading a small dragger at State Fish Pier, Gloucester, Mass.

in 1964. The principal decrease occurred in yellowfin landings, but albacore and bluefin landings also declined. However, albacore production is improving.

**Menhaden:** Landings during the first 7 months of 1965 totaled 980 million pounds--an increase of 24 million pounds. Landings were up sharply in the Gulf area but the gain was partially offset by reduced production along the Atlantic Coast.

**Shrimp:** Landings in the South Atlantic and Gulf States from January through July increased from 86 million pounds in 1964 to 102 million pounds in 1965--a gain of 18 percent.

**Mackerel:** Landings of Pacific mackerel (800,000 pounds) and jack mackerel (33 million pounds) to August 27 were down 11 million pounds and 13 million pounds, respectively, compared with the same period in 1964.

**Industrial fish:** Landings for the first 7 months of 1965 in Maine and Massachusetts of species used chiefly in the manufacture of fish meal and oil totaled 43 million pounds--a gain of 24 million pounds or 130 percent.



## U. S. Fishing Vessels

### DOCUMENTS ISSUED AND CANCELLED, JUNE 1965:

During June 1965 a total of 88 vessels of 5 net tons and over was issued first docu-

U. S. Fishing Vessels 1/--Documentations Issued and Cancelled, by Areas, June 1965 with Comparisons				
Area (Home Port)	June		Jan.-June	
	1965	1964	1965	1964
. . . . (Number). . . . .				
<b>Issued first documents 2/:</b>				
New England . . . . .	4	6	17	19
Middle Atlantic . . . . .	2	-	7	5
Chesapeake . . . . .	4	5	18	23
South Atlantic . . . . .	10	4	37	25
Gulf . . . . .	31	28	144	120
Pacific . . . . .	37	27	113	80
Great Lakes . . . . .	-	-	1	1
Hawaii . . . . .	-	1	-	1
Puerto Rico . . . . .	-	1	1	1
<b>Total . . . . .</b>	<b>88</b>	<b>72</b>	<b>338</b>	<b>275</b>
<b>Removed from documentation 3/:</b>				
New England . . . . .	5	3	23	17
Middle Atlantic . . . . .	-	3	11	12
Chesapeake . . . . .	4	1	18	17
South Atlantic . . . . .	2	4	43	24
Gulf . . . . .	14	7	54	54
Pacific . . . . .	10	13	47	82
Great Lakes . . . . .	1	-	9	9
Hawaii . . . . .	-	-	2	-
Puerto Rico . . . . .	1	-	1	-
<b>Total . . . . .</b>	<b>37</b>	<b>31</b>	<b>208</b>	<b>215</b>
1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.				
2/There were 10 redocumented vessels in June 1965 previously removed from the records. Vessels issued first documents as fishing craft were built: 63 in 1965; 3 in 1964; 1 in 1962; 2 in 1957; 1 in 1954; and 18 prior to 1949.				
3/Includes vessels reported lost, abandoned, forfeited, sold, alien, etc.				
Source: Monthly Supplement of Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.				

ments as fishing craft as compared with 72 in June 1964. There were 37 documents cancelled for fishing vessels in June 1965 as compared with 31 in June 1964.



## U. S. Foreign Trade

### IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

United States imports of tuna canned in brine during January 1-August 1, 1965, amounted to 24,618,503 pounds (about 1,172,310 standard cases), according to preliminary data compiled by the U. S. Bureau of Customs. That was an increase of 13.3 percent from the 21,726,482 pounds (about 1,034,600 standard cases) imported during January 1-August 1, 1964.



The quantity of tuna canned in brine which can be imported into the United States during the calendar year 1965 at the 12½-percent rate of duty is limited to 66,059,400 pounds (or about 3,145,685 standard cases of 48 7-oz. cans). Any imports in excess of that quota will be dutiable at 25 percent ad valorem.



## Virginia

### FISHERY LANDINGS, 1964:

Commercial fishery landings in Virginia in 1964 totaled 465.7 million pounds with an ex-vessel value of \$24.2 million as compared with 1963 landings of 374.7 million pounds worth \$19.1 million. Heavier landings of menhaden accounted for most of the increase in quantity, while a better harvest of oysters and blue crab contributed to the increase in value. Menhaden, blue crab, and oysters, together with alewives and scup, accounted for 93 percent of the 1964 landings.

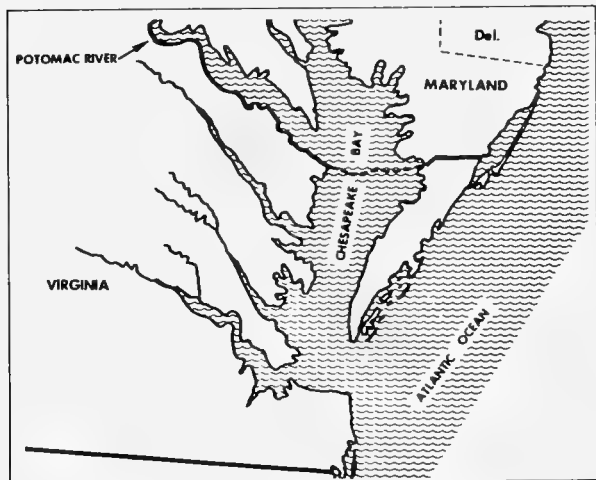


Fig. 1 - Virginia fishing areas.

Virginia's menhaden landings in 1964 totaled 330.2 million pounds with an ex-vessel value of \$4.7 million as compared to 255.7 million pounds in 1963 with an ex-vessel value of \$3.3 million.

Blue crab landings in 1964 were 52.5 million pounds with an ex-vessel value of \$4.1 million--up 11 percent in quantity and 38 percent in value from 1963. The 1964 harvest of market oysters totaled 14.2 million pounds with an ex-vessel value of \$10.3 million--up 34 percent in quantity and 27 percent in value from 1963. Hard clam landings in 1964 totaled 2.4 million pounds with an ex-vessel value of \$1.2 million, compared to 2.1 million pounds worth \$1.0 million in 1963.

The leading food finfish items landed in 1964 were alewives 26.6 million pounds, scup 10.9 million pounds, swellfish 4.3 million pounds, sea bass 3.8 million pounds, spot 3.2 million pounds, and shad 2.6 million pounds. Other finfish landings topping the million-pound mark were flounder (mostly

fluke), butterfish, striped bass, catfish, sea trout, and shark or steakfish.



Fig. 2 - Fishing craft docked at Hampton, Va. On the left are 2 oyster dredgers; in the center, 2 draggers; and on the extreme right, 2 crab boats.

Swordfish landings in 1964 increased to 635,400 pounds worth \$207,900 ex-vessel. Nevertheless, expectations that Virginia ports would become swordfish centers were not realized. The great majority of the swordfish catches on southern grounds were landed elsewhere. Virginia vessels did not participate in the swordfish fishery in 1964.

The leading fishing area in Virginia in 1964 was Chesapeake Bay with landings of 322.2 million pounds, followed by the Atlantic area with 76.3 million pounds, Chesapeake Bay tributaries with 41.4 million pounds, and the Potomac River with 25.8 million pounds. Landings by area in 1963 were Chesapeake Bay 268.6 million pounds, Atlantic Ocean 54.5 million pounds, Chesapeake Bay tributaries 30.4 million pounds, and Potomac River 20.7 million pounds.



## Washington

### FISH FARMING PROGRAM FOR SALMON EVALUATED:

The fish farm program in the State of Washington will be upgraded and consolidated during the next 2 years by the elimination of a number of the poorer areas, according to the State Fisheries Director.

The decision was prompted by an economic evaluation completed in 1965 of the success of rearing coho (silver) salmon in fish farms. The study estimated that in the overall there has been only 14 cents benefit in salmon production for each tax dollar spent. The study is the culmination of intensive sampling and evaluation over the past two years.

Fish farming of salmon would continue to be a useful tool in fish propagation, but at this stage of development can not assume the major role, the Fisheries Director said. Efforts will be continued to reduce costs and increase production in salmon rearing to assure the greatest catch possible for the money spent, he added. (Department of Fisheries, Olympia, August 18, 1965.)

\* \* \* \* \*

#### NEW FEE SCHEDULE FOR COMMERCIAL FISHING LICENSES:

Washington State commercial fishermen will not be required to have a personal fishing license after August 6, 1965, announced the Director of the Washington State Department of Fisheries on July 28, 1965.

A new fee schedule for commercial fishing licenses became effective on August 6--90 days after passage by the 1965 Legislature of the new schedule. The new gear license fees were increased to include personal licenses for all crew members, so after that date it will not be necessary for each commercial fisherman to have an individual fishing license.

In 1965, all commercial salmon fishing gear licenses had to be obtained by February 1; in 1966 the deadline will be April 1. It was emphasized that these licenses are for commercial fishing only. In Washington State there is no license required for any personal use (sport) fishing for food fish, although salmon fishermen must have a salmon punch card, which is free and nonlimiting. (Department of Fisheries, Olympia, July 28, 1965.)



### Wholesale Prices

#### EDIBLE FISH AND SHELLFISH, AUGUST 1965:

Prices for fresh and frozen fish in August 1965 were higher than the normal seasonal summer pattern. At 114.3 percent of the 1957-59 average, the wholesale index for edible fishery products (fresh, frozen, and canned) rose 4.1 percent from the previous month. Compared with August 1964, the overall index this August was up 8.4 percent. August 1965 prices generally ranged from higher to sharply higher than in the same month a year earlier.

Prices for all items in the subgroup for drawn, dressed, or whole finfish rose from July to August, with the index up 12.1 percent. There was a steep price increase at Boston for ex-vessel large haddock (up 61.6 percent) because of very light landings. At New York City, prices were up 12.0 percent for Great Lakes round yellow pike, 1.4 percent for western fresh salmon, and 1.0 percent for western fresh halibut. Chicago prices for Lake Superior fresh whitefish were up 8.6 percent from the previous month. As compared with August 1964, the subgroup index this August was up 16.4 percent. Except for salmon, all other prices in the subgroup were sharply higher than a year earlier--up 77.3 percent for ex-vessel haddock, 29.6 percent for yellow pike, 21.8 percent for halibut, and 21.1 percent for whitefish.



Loading foreign ship with steel-strapped overseas-packaged canned salmon at Port of Seattle Salmon Terminals.

The August 1965 fresh processed fish and shellfish subgroup was up slightly (0.2 percent) from the previous month solely because of the 2.5 percent price increase at Boston for fresh haddock fillets. Compared with the same month a year earlier, most prices this August were substantially higher and the index was up by 7.6 percent. Prices were up 15.5 percent for fresh haddock fillets and 12.5 percent for South Atlantic fresh shrimp at New York City. Prices at Norfolk for standard shucked oysters, while unchanged June-August 1965, were up 1.9 percent from August 1964.

The subgroup index for frozen processed fish and shellfish dropped 0.9 percent from July to August. Higher prices for frozen flounder and haddock fillets were more than

Wholesale Average Prices and Indexes for Edible Fish and Shellfish, August 1965 with Comparisons								
Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices <sup>1/</sup> (\$)		Indexes (1957-59=100)			
			August 1965	July 1965	August 1965	July 1965	June 1965	August 1964
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					114.3	109.8	108.9	105.4
<b>Fresh &amp; Frozen Fishery Products:</b>					117.4	112.8	111.5	106.9
Drawn, Dressed, or Whole Finfish:					133.4	119.0	113.3	114.6
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.19	.12	147.7	91.4	88.2	83.3
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.51	.50	149.4	147.9	129.4	122.7
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.91	.90	127.5	125.8	121.4	129.2
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.64	.59	94.8	87.3	91.8	78.3
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.70	.63	114.6	102.3	90.1	88.4
<b>Processed, Fresh (Fish &amp; Shellfish):</b>					108.8	108.6	109.6	101.1
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.41	.40	99.6	97.2	86.2	86.2
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.86	.86	100.8	100.8	104.3	89.6
Oysters, shucked, standards	Norfolk	gal.	7.13	7.13	120.2	120.2	120.2	118.0
<b>Processed, Frozen (Fish &amp; Shellfish):</b>					104.8	105.7	106.6	100.0
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.39	98.8	97.6	98.8	95.0
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.38	.37	111.4	108.5	108.5	108.5
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.31	.32	108.7	112.2	105.2	106.9
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.85	.88	100.8	103.7	105.5	94.9
<b>Canned Fishery Products:</b>					109.4	104.9	104.9	103.1
Salmon, pink, No. 1 tail (16 oz.), 48 cans/cs.	Seattle	cs.	24.50	22.00	106.8	95.9	95.9	97.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.56	11.56	102.6	102.6	102.6	102.6
Mackerel, jack, Calif., No. 1 tail (15 oz.), 48 cans/cs.	Los Angeles	cs.	7.13	7.13	120.9	120.9	120.9	105.9
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	10.25	10.25	131.5	131.5	131.5	119.4

<sup>1/</sup>Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

offset by lower prices at Boston for ocean perch fillets (down 3.1 percent) and at Chicago for frozen shrimp (down 2.8 percent). But prices this August were higher for all items than in the same month of 1964, with the subgroup index up 4.8 percent.

The one and only change in August 1965 prices for canned fishery products was in canned pink salmon--up 11.4 percent from the previous month. The subgroup index was up 4.3 percent from the previous month. The stronger market for canned salmon was due to marked improvement in movement of the previous season's stocks and also because of

the failure of the 1965 pink salmon run. Toward the end of August 1965 the new pack of pink salmon was less than half that packed at the same time a year earlier. Prices for canned Maine sardines were unchanged from July to August--the new season pack picked up substantially by the end of August when it was about double that for the same period in 1964. Canned fish prices this August were higher than in the same month a year earlier and the index was up 6.1 percent. Prices were up 10.1 percent for pink salmon, 14.2 percent for California jack mackerel, and 10.1 percent for Maine sardines. There was no change in canned tuna prices.







## International

### FISH MEAL

#### PRODUCTION AND EXPORTS FOR SELECTED COUNTRIES, JANUARY-MAY 1965:

Member countries of the Fish Meal Exporters' Organization (FEO) account for about 90 percent of world exports of fish meal. The FEO countries are Chile, Angola, Iceland, Norway, Peru, and South Africa/South-West Africa.

Country	May		Jan.-May	
	1965	1964	1965	1964
. . . (1,000 Metric Tons). . . . .				
Chile . . . . .	5.7	9.2	46.4	62.2
Angola . . . . .	1.6	8.0	21.3	23.9
Iceland . . . . .	10.6	7.2	42.7	47.7
Norway . . . . .	13.6	17.5	73.6	95.4
Peru . . . . .	157.9	133.0	785.8	664.0
So. Africa (including S.-W. Africa) . . .	23.7	27.5	90.1	90.2
Total . . . . .	213.1	202.4	1,059.9	983.4

Country	May		Jan.-May	
	1965	1964	1965	1964
. . . (1,000 Metric Tons). . . . .				
Chile . . . . .	3.8	14.5	41.4	75.2
Angola . . . . .	1.7	7.1	17.2	24.7
Iceland . . . . .	7.1	4.5	34.3	35.6
Norway . . . . .	27.8	11.2	107.0	86.0
Peru . . . . .	127.9	123.4	786.1	777.7
So. Africa (including S.-W. Africa) . . .	37.3	33.4	149.2	130.0
Total . . . . .	205.6	194.1	1,135.2	1,129.2

Peru accounted for about 74 percent of the 1,059,900 metric tons of fish meal exported by FEO countries in January-May 1965.

\* \* \* \* \*

#### WORLD PRODUCTION, MAY 1965:

World fish meal production in May 1965 showed only a small increase over the previous month. A decline in Peruvian output almost offset higher production in the United States, Canada, Denmark, Iceland, Norway, and South Africa.

Country	May		Jan.-May	
	1965	1964	1965	1964
. . . . . (Metric Tons). . . . .				
Canada	5,594	3,941	29,487	16,401
Denmark	11,636	8,466	42,359	30,074
France	1,100	1,100	5,500	5,500
German Fed. Repub.	4,823	5,279	26,850	31,550
Netherlands	704	400	2,408	2,900
Spain	3,209	1/	13,247	1/
Sweden	529	531	3,969	3,428
United Kingdom	6,067	5,467	34,639	33,812
United States	21,003	29,066	2/38,201	2/43,262
Angola	1,671	7,114	17,242	24,747
Iceland	7,092	4,547	34,324	35,669
Norway	27,799	11,228	107,009	86,048
Peru	127,885	123,336	786,115	777,778
So. Afr. (including S.-W. Afr.)	38,616	33,297	150,798	130,277
Belgium	375	375	1,875	1,875
Chile	3,865	14,501	41,367	75,253
Morocco	500	2,150	1,100	4,060
Total	262,488	250,798	1,336,480	1,302,634

1/Data not available.

2/Revised.

Note: Japan does not report fish meal production to the International Association of Fish Meal Manufacturers at present.

World fish meal production in January-May 1965 was about the same as that in the first 5 months of 1964. Peru accounted for about 59 percent of total output in January-May 1965. Most of the principal countries producing fish meal submit data to the International Association of Fish Meal Manufacturers monthly (see table).

#### FOOD AND AGRICULTURE ORGANIZATION

#### DEPARTMENT OF FISHERIES APPROVED BY FAO COUNCIL:

The Forty-Fourth Council Session of the Food and Agriculture Organization (FAO) met June 21-July 2, 1965, and approved the elevation of its Fisheries Division to departmental

## International (Contd.):

status with an Assistant FAO Director-General for Fisheries in the 1966-67 biennium. The vote of the Member Governments of the Council was 19 for departmental status, 7 against, and 1 abstention. The Council also approved the establishment of the Permanent Committee on Fisheries under Article V of the FAO Constitution and generally endorsed the Director-General's proposals for strengthening fisheries within the Organization. Those matters will now be brought before the 13th Session of the FAO Conference, to be convened November 20-December 10, 1965, and will be subject to final approval.

Although the resolution calling for an FAO Department of Fisheries in the 1966-67 biennium lacked unanimity, there was almost unanimous agreement that fisheries should be strengthened within FAO, that FAO should become the leading intergovernmental body in fisheries, and that a Permanent Committee on Fisheries should be formed.

Member countries represented at the FAO Council Session were Argentina, Brazil, Canada, Costa Rica, Ethiopia, Federal Republic of Germany, Finland, France, Greece, India, Iran, Italy, Japan, Jordan, Korea, Lebanon, Malaysia, Morocco, New Zealand, Nigeria, Pakistan, Peru, Poland, Senegal, United Kingdom, United States, and Venezuela. Many other countries and international organizations attended as observers.

Note: See Commercial Fisheries Review, Feb. 1964 p. 61.

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#### INDO-PACIFIC FISHERIES COUNCIL INVITED TO HOLD 12TH SESSION IN HAWAII IN 1966:

The United States has issued an invitation to the Indo-Pacific Fisheries Council of the Food and Agriculture Organization to hold its 12th session at the University of Hawaii in Honolulu, October 3-17, 1966.

The Indo-Pacific Fisheries Council was established under an agreement signed at Baguio, Philippines, in 1948. Its objectives are "the development and proper utilization of the living aquatic resources of the Indo-Pacific area" and the "further attainment of these ends through international cooperation." Members of the Council are: Australia, Burma, Cambodia, Ceylon, France, India, Indonesia, Japan, South Korea, Malaysia, the

Netherlands, Pakistan, the Philippines, Thailand, the United Kingdom, the United States, and South Vietnam.

Note: See Commercial Fisheries Review, April 1965 p. 48, and March 1965 p. 64.

\* \* \* \* \*

#### TRAINING COURSE IN VESSEL DESIGNING GIVEN IN SWEDEN:

A total of 18 ship designers from Asia, Africa, and Latin America were scheduled to work together from August to November 1965 in Sweden to design fishing vessels capable of catching more fish in their own countries. On August 2 they began a training course sponsored jointly by the Food and Agriculture Organization (FAO) and the Swedish Government at Chalmers Technical University in Goteborg, Sweden. The cost of the course (about US\$60,000) was to be paid by the Swedish International Development Authority (SIDA) as a contribution to the FAO Freedom-from-Hunger-Campaign.

The chief of FAO's Fishing Boat Section said in an interview, "this is not for beginners, by any means. These students are mature men in their 30's, high-ranking officers in charge of boat development in the fisheries departments of their own countries. We have asked them to bring ideas on boat types their fishermen need to meet local conditions. Four top naval architects, headed by Course Director Clof Falkendal, will provide individual assistance in working out these designs. The result of the course may be a few new boat designs specialized for the needs of 8 countries. If we end up with one new useful idea for each country on how to produce fish more cheaply, the course will have had great economic consequence."

At the end of the course the designers will participate in the third FAO technical meeting on fishing boats to be held in Goteborg, October 23-29, 1965. Some 300 internationally-known boat experts are expected to attend the meeting. (Food and Agriculture Organization, Rome, July 20, 1965.)

Note: See Commercial Fisheries Review, July 1965 p. 57, February 1965 p. 48, Sept. 1964 p. 64.

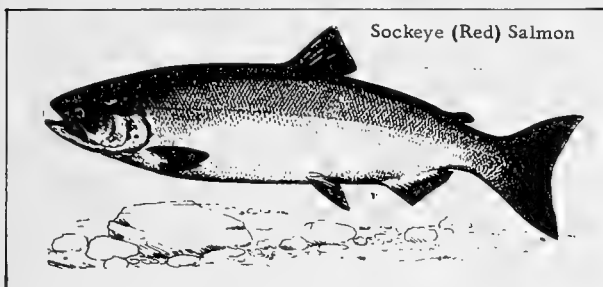
#### INTERNATIONAL PACIFIC SALMON FISHERIES COMMISSION

#### FRASER RIVER SOCKEYE SALMON FISHERY TRENDS, JULY-EARLY AUGUST 1965:

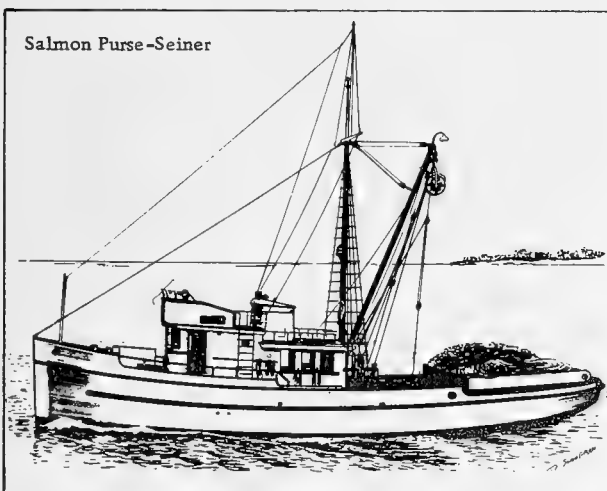
Following a light early season catch, the Fraser River sockeye salmon runs provided

## International (Contd.):

good catches for United States and Canadian fishermen in the third and fourth week of July 1965. The International North Pacific Salmon Fisheries Commission regulates the fishery so as to provide for both adequate escapement and an equal division of the catch between the two countries.



Division of the catch was creating some problems. United States Puget Sound fishermen were about 200,000 fish ahead in late July. The Commission therefore granted Canadian fishermen an additional 24 hours of fishing time in the week beginning July 25, 1965. It was expected that the opening of the Strait of Juan de Fuca to fishing in early August 1965 would also help divide the catch more equally.



Washington commercial salmon fishermen were given one more day of fishing the week of August 1 in Area 1 (northern Puget Sound east of Angeles Point), the Director of the Washington State Fisheries Department announced August 4. The additional day was granted pursuant to recommendations of the

International Pacific Salmon Fisheries Commission, because escapement has been assured for the early Stuart sockeye run (now being fished upon) and to achieve division of catch between U. S. and Canadian fishermen. Fishing is being carried out by purse seines, reef nets, and gill nets.

The International Pacific Salmon Fisheries Commission held a meeting August 2 to consider the regulations required to lessen the disparity in the Canadian catch of Fraser River sockeye. At the end of July the sockeye catch was 746,000 fish for U. S. fishermen and 535,000 fish for Canadian fishermen. The Chairman of the Commission said the smaller Canadian catch was due primarily to an increase in the efficiency of Puget Sound fishing gear which became very noticeable during last year's fishing season. He said that it had been very difficult to obtain even minimum escapements this year, in spite of lengthy closures, and that the Canadian catch had fallen behind substantially for the past two weeks.

A substantial migration of sockeye in the Fraser River on August 1 and 2 relieved the escapement problem so it was possible for the Commission to limit its regulatory considerations solely to the catch division problem for the week of August 1. (International Pacific Salmon Fisheries Commission, July 21 and 29, 1965.)

## NORTH PACIFIC FISHERIES CONVENTION

### RENEWAL OF NEGOTIATIONS ON NORTH PACIFIC PROBLEMS RECOMMENDED BY UNITED STATES- JAPAN ECONOMIC COMMITTEE:

The Fourth Meeting of the Joint United States-Japan Committee on Trade and Economic Affairs was held in Washington on July 12-14, 1965, under the Chairmanship of the U. S. Secretary of State. The meeting was the forum for a major review of trade and economic relations between the two countries, not only from a bilateral point of view, but also from a global perspective. The discussion covered a wide range of trade and economic affairs.

The North Pacific Fisheries Convention was one of the matters discussed. The Committee recalled with satisfaction that the two Governments reached an interim agreement on the East Bering Sea king crab question in November 1964, making another step forward in solving problems between the two coun-

### International (Contd.):

tries. It was agreed that, for the purposes of an early resumption of the recessed negotiations on the Convention, each side should make the preparations needed to create an atmosphere which would ensure reaching an agreement based on recognition of the legitimate interests of the United States, Japan, and Canada.

### UNITED NATIONS

#### SPECIAL FUND FISHERY PROJECT FOR THE PHILIPPINES:

The Plan of Operations for the United Nations Special Fund fishery project for the Philippines was signed May 14, 1965. Called the Deep-Sea Fishing Development Project, it will receive Special Fund assistance for 5 years, with Manila as the main operating base for the project. Biological work, fish processing and marketing investigations, and vessel designing will be carried out at appropriate facilities of the Philippine Fisheries Commission.

The Deep-Sea Fishing Development Project for the Philippines will experiment with and demonstrate different fishing techniques including purse-seining, trawling, tuna long-lining, line-bait fishing, gill-netting, troll fishing, and line fishing. Experimental fishing operations with various types of vessels and equipment will take place in the waters around the Philippine Islands. There are now 30 privately owned vessels in operation using the purse-seine method.

Fishermen will be trained on experimental fishing vessels as well as on commercial vessels and the project will be conducted in close cooperation with the industry. Approximately 400 Philippine fishermen have so far been trained in purse-seining by the United Nations Master Fisherman. The catch of the purse-seine vessels has increased by about 25,000 metric tons in one year.

During the fishing cruises scheduled under the Project, biological observations will be made on the catches for demonstration and training of counterpart staff. They will also be the basis of a program of biological sampling and assessment of the fish stocks.

Work will be done on improving methods of fish handling, preservation, and processing. The fish-processing plants of the Philip-

pine Fisheries Commission will be made available for experimental work and training purposes.

Studies will be made on improvements necessary in the wholesale and retail distribution systems to better handle increased fish supplies. Analyses will be made of probable future developments in the demand for fishery products, both geographically and in relation to types and processing methods.

Advisory services will be made available in the financing of development projects and advice will be given to the industry and to boat builders on the most appropriate vessel building and conversion techniques.

The executing agency for the United Nations Special Fund project is the Food and Agriculture Organization (FAO) and the total United Nations staff will consist of 12 experts after the project is operational.

The Special Fund allocation for the Philippine fishery project is \$1,396,900 and includes \$40,000 for 12 fellowships. Counterpart contribution by the Philippine Government in funds, services, facilities, and equipment is \$2,363,260.

Note: See Commercial Fisheries Review, May 1965 p. 55, and April 1965 p. 49.

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#### SPECIAL FUND FISHERY ASSISTANCE FOR BRAZIL:

Approval in July 1965 by the United Nations Special Fund of a \$3.5 million program for technical assistance in Brazilian fisheries development represents a significant advance in the slow progress being made toward industrialization of that country's fishery resources. Of the total needed for the program, \$1.9 million will be supplied by the Brazilian Government and \$1.6 million by the United Nations Special Fund. The Food and Agriculture Organization (FAO) of the United Nations will administer the program, which calls for reorganization of governmental fisheries institutions, the establishment of new legislation on fishing, research, training, etc.

Brazil's Director of the Superintendency of Fisheries (SUDEPE) has also announced that President Branco intends to classify the fishery industry as a base industry eligible to receive assistance from the Brazilian National Economic Development Bank. The lack of

## International (Contd.):

refrigerated storage and distribution facilities, one of the chief obstacles to expansion of fishery production in Brazil, is expected to be alleviated slightly with the start of operations later in 1965 of a large private refrigeration plant nearing completion in São Sebastião, State of São Paulo. The company plans to distribute frozen and salted fish to 12 cities in the interior of São Paulo and 3 cities in Minas Gerais, as well as to the capital city of Brasília and other localities. Meanwhile, SUDEPE is reportedly making short term loans to São Paulo fishermen for the purchase of ice, nets, and other equipment. (United States Embassy, Rio de Janeiro, August 16, 1965.)

Note: See Commercial Fisheries Review, May 1965 p. 55; April 1965 p. 49.

## WHALE OIL

## WORLD PRODUCTION,

## 1961-1964 AND FORECAST 1965:

World production of baleen whale oil during 1965 (including the 1964/65 Antarctic season) is forecast at 210,000 short tons, 16 percent below the 249,100 produced in 1964. The 1965 world sperm oil output also is forecast at a lower level--155,000 tons compared with 171,900 tons in 1964.

Those estimates are based upon the assumption that production of baleen and sperm whale oil from whaling grounds outside the Antarctic will not change significantly from that of 1964. The most important whaling area outside the Antarctic is the North Pacific, where production (especially sperm oil)

has increased in recent years because of increasing whaling activities by the U.S.S.R., in particular, but also by Japan and Canada. The U.S.S.R. and Japan operated 4 and 3 pelagic expeditions, respectively, in the North Pacific during the 1964 summer season.

The production of baleen oil in the 1964/65 Antarctic whaling season (from December 12, 1964, to April 7, 1965) totaled 165,445 tons, 17 percent (or 33,967 tons) below the previous season's output. All countries registered a decline. Antarctic sperm oil production in 1964/65 amounted to 54,453 tons, 18 percent (or 12,358 tons) below that of the previous season. All countries, except Norway, registered declines.

The output for the Antarctic whaling season accounted for 80 and 39 percent of the total world production of baleen and sperm oil, respectively, in 1964, as against 82 and 29 percent in 1963.

At the 17th annual meeting of the International Whaling Commission, which was held in London in June 1965, the maximum catch quota for the 1965/66 Antarctic pelagic season was reduced to 4,500 blue-whale units (from 8,000 units in 1964/65). According to the international quota agreement, the 1965/66 catch quota shall be apportioned as follows: Japan 2,340 units, Norway 1,260 units, and the U.S.S.R. 900 units. (Editor's Note: That quota applies only to factoryship operations. It does not apply to the shore stations at South Georgia.)

The U.S.S.R. and Japan are the leading world producers of whale oil. Virtually all

Table 1 - Antarctic Whale Oil Production, 1962/63 to 1964/65

Participating Country	Baleen Oil			Sperm Oil <sup>1/</sup>		
	2/ 1964-65	1963/64	1962/63	2/ 1964/65	1963/64	1962/63
..... (Short Tons) .....						
<b>Factoryships:</b>						
Japan . . . . .	92,822	105,133	124,865	12,396	22,505	11,611
U.S.S.R. . . . .	32,507	40,184	58,563	30,019	31,428	17,671
Norway . . . . .	32,802	37,940	34,636	10,767	9,421	8,140
Netherlands . . . . .	-	8,989	11,790	-	2,888	3,278
United Kingdom . . . . .	-	-	12,535	-	-	2,425
Total from factoryships . . . . .	158,131	192,246	242,389	53,183	66,241	43,125
<b>Shore Stations at South Georgia:</b>						
Japan:						
Grytviken . . . . .	2,772	3,628	-	950	277	-
Leith Harbor . . . . .	4,541	3,538	-	320	293	-
Total from shore stations . . . . .	7,314	7,166	-	1,270	570	-
Total Antarctic . . . . .	165,445	199,412	242,389	54,453	66,811	43,125

<sup>1/</sup>Including catch of sperm whales north of 40° S. latitude on voyage to and from the Antarctic.

<sup>2/</sup>Preliminary.

Source: The Norwegian Whaling Gazette, No. 4, April 1965, Oslo.

## International (Contd.):

Table 2 - World Production of Whale Oil, 1961-64

Country	Baleen Oil				Sperm Oil			
	1/1964	1963	1962	1961	1/1964	1963	1962	1961
	(1,000 Short Tons)							
Japan . . . . .	127.0	140.1	143.4	126.8	51.2	42.0	37.3	34.9
U.S.S.R. . . . .	61.0	81.1	81.5	65.7	53.9	52.0	29.2	27.6
Norway . . . . .	38.3	34.9	94.6	126.4	9.8	9.2	14.0	14.6
Netherlands . . . . .	9.0	11.8	13.6	24.3	2.9	3.3	3.3	1.9
United Kingdom . . . . .	-	12.5	36.1	54.6	-	2.4	3.7	2.7
Australia . . . . .	-	.7	5.8	12.5	5.6	4.6	4.5	3.5
South Africa . . . . .	4.6	6.5	6.6	8.9	12.1	11.4	11.5	7.7
Peru . . . . .	.2	-	-	-	14.1	11.4	12.6	14.4
Chile . . . . .	2.0	.4	.3	1.6	4.8	5.3	7.0	7.1
Canada . . . . .	2.6	2.4	2.2	-	.6	.8	.9	-
Iceland . . . . .	2.0	2.3	2.3	1.1	1.6	1.5	1.5	1.7
Brazil . . . . .	.7	1.0	2.1	2.6	2/	.2	.4	.4
United States <sup>3/</sup> . . . . .	1.4	.7	1.1	1.8	.2	.3	.3	.4
Portugal . . . . .	-	-	-	2/	3.0	3.3	2.8	2.6
New Zealand . . . . .	2/	.1	.3	.8	1.0	.9	2/	-
Spain . . . . .	.2	.1	.1	.5	1.0	.5	.7	.5
Denmark (Faroe Islands) . . . . .	.1	2/	2/	-	.1	.1	.1	-
World total . . . . .	249.1	294.6	390.1	427.7	171.9	149.2	129.8	119.9

1/Preliminary.

2/Less than 50 tons.

3/Including Ryukyu Islands.

Source: The Norwegian Whaling Gazette, Oslo, and International Whaling Statistics, Oslo,

the Soviet output is retained for domestic use. Japan, besides satisfying her own domestic requirements, is the major world supplier of both baleen and sperm oil. Norway and the Republic of South Africa are also important contributors to world supplies. The member countries of the European Common Market, the United Kingdom, the United States, and the U.S.S.R. account for virtually all the world's imports of whale oil.

Note: See Commercial Fisheries Review, Sept. 1965 p. 53.

## WHALING

## JAPAN TO HOST 5-NATION WHALING CONFERENCE:

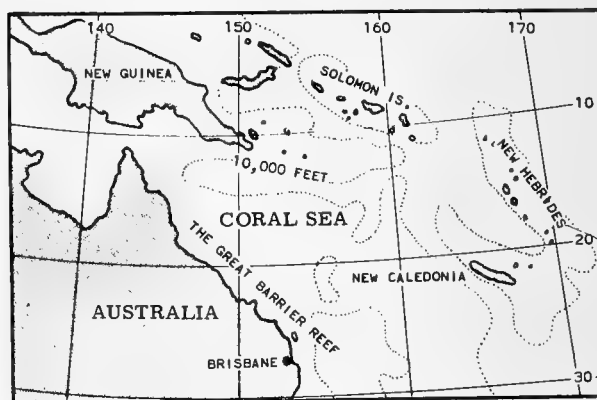
The Japanese Government agreed to host a 5-nation whaling conference September 1-8, 1965, at Tokyo to discuss the allocation of the annual whale catch quota. Invitations were sent to the Governments of the Soviet Union, Norway, Great Britain, and the Netherlands. Japan's basic position at that conference was likely to be as follows: (1) Japan will not agree to any adjustments in the allocation of the whaling quota for the 20th International Whaling Expedition (1965/66), and (2) Japan cannot but help make some concession in the whaling quota beginning with the 21st Expedition (1966/67) inasmuch as the existing agreement will then have expired; however, she will insist that in developing a new allocation formula the past 5-year record on whaling be respected. (Suisan Keizai Shimibun, August 7, 1965.)



## Australia

## TUNA SURVEY IN NORTHERN WATERS PLANNED:

A survey of waters outside Australia's Great Barrier Reef in the Coral Sea to determine the prospects of establishing a yellowfin tuna fishery in that area was to be made jointly during summer 1965 by the Australian Federal and State of Queensland Governments.



Adult tuna are taken by the Japanese in deeper waters of the Coral Sea by the long-line method, which is little used by Australian fishermen. In 1964, an Australian mission which investigated long-line tuna fishing in Japan, Hawaii, and American Samoa, reported that, "unless the present cost-price relationship of the Australian tuna fishing industry changes substantially it is considered



## Australia (Contd.):

that Australian fishermen could not operate profitably in deep-sea long-lining for tuna on a year-round basis."

It is believed, however, that there may be important concentrations of surface-schooling juvenile yellowfin tuna just outside the Barrier Reef, and that they can be taken by the pole- and-bait method, which is now well established in Australia.

Total cost of the survey was estimated at A£34,000 (US\$76,000), with the Commonwealth providing £17,000 (\$38,000) from the Fisheries Development Trust Account, and the Queensland State Government a similar amount.

The survey was to be concentrated in Queensland waters off Gladstone, Cairns, and Townsville, over two consecutive periods of 8 weeks each scheduled to start in August 1965. The survey was to be under the technical direction of the Division of Fisheries and Oceanography of the Commonwealth Scientific and Industrial Research Organization (CSIRO). It will be administered by the Queensland Department of Harbours and Marine and a committee comprising representatives of the CSIRO. The Department of Primary Industry and the Department of Harbours and Marine will be responsible for the overall supervision.

It was planned to use an aircraft to spot tuna shoals, and a supporting fishing vessel to catch and identify the fish and obtain scientific and technical data which cannot be obtained from the air.

The first stage of the survey will be based on Gladstone and will cover the Swains, the Saumarez, the Frederick and Wreck Reefs, Cato and Lady Frederick Islands. During the second period, which will immediately follow the first, it is proposed to cover reefs off-shore between Townsville and Cairns, extending 300 miles seaward to the Lihou Reef. (Australian Fisheries Newsletter, August 1965.)

Note: See Commercial Fisheries Review, August 1965 p. 65; June 1965 p. 46.

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#### EXPORTS AND IMPORTS OF MARINE PRODUCTS, FISCAL YEAR 1964/65:

Australia's exports of marine products in fiscal year 1964/65 (July 1-June 30) increased

25 percent from the previous year to a record high value of A£10.4 million (US\$23.3 million). This was 78 percent more than the export value five years earlier.

The main reasons given for exports exceeding £10 million for the first time were the big increases in the quantity of shrimp, scallops, and canned abalone sold to overseas markets, and high prices received for frozen spiny lobster tails in the United States.

The total quantity of shrimp exported for the year was 2.4 million pounds valued at \$2.4 million, an increase of 75 percent in value as compared with 1963/64.

Scallops, a new export item for Australia, were worth \$973,000 despite a sharp decrease in shipments in June 1965 when only 82,000 pounds were exported.

The value of canned fish exports, including abalone, increased to \$370,000 in 1964/65, three times more than in the previous year.

The quantity of frozen spiny lobster tails exported dropped to the level of 1959/60 to 7.8 million pounds but the value in 1964/65 rose to \$15.2 million, or 22 percent more than the previous year.

The total value of edible marine products exported in 1964/65 was \$20.3 million compared with \$16 million in the previous year, while exports of nonedible marine products were worth \$2.9 million compared with \$2.6 million in 1963/64. Exports of whole spiny lobster dropped by 38 percent to \$625,000.

Western Australia remained the major spiny lobster exporter, contributing 78 percent of the total income earned by tails and 57 percent of the whole product.

The United States remained the main market for spiny lobster tails, taking nearly \$15 million worth in a 12-month period. France was the main outlet for whole spiny lobster with exports valued at \$412,000.

During June 1965 wholesale prices for Australian spiny lobster tails in New York City rose to \$2.52 a pound and prices went up still higher to \$2.55 a pound in July..

Japan and South Africa took most of Australia's shrimp exports in 1964/65 while France was the main buyer of scallops.

## Australia (Contd.):

While Australia's marine products exports have increased 78 percent in the past 5 years, imports of fishery products are estimated to have increased 67 percent during the same period. To the end of May 1965, imports for the first 11 months of the year were valued at £12.5 million (\$27.9 million), an increase of 13 percent over the previous year. (Australian Fisheries Newsletter, August 1965.)

Notes: (1) Values converted at rate of A£1 equals US\$2.24.  
(2) See Commercial Fisheries Review, Aug. 1965 p. 67; Jan. 1965 p. 63.



## Canada

NEW BOTTOMFISH STOCKS  
LOCATED OFF BRITISH COLUMBIA:

The 80-ton chartered trawler Ocean Traveller sailed July 10, 1965, to begin bottomfish explorations off the east coast of the Queen Charlotte Islands of British Columbia. The study was sponsored by the Canadian Department of Fisheries.

Working in depths of 38-55 fathoms and using bobbin gear with 14-inch rollers, the vessel located commercial stocks of grey cod 7 miles northeast of Reef Island. Hauls of 7,000 pounds were taken in 10 minutes. Important stocks of brill were located in the same area.

The Ocean Traveller supplemented exploratory work with sampling and tagging to identify bottomfish stocks and routes of migration off British Columbia.

\* \* \* \* \*

FISHERMEN'S IMPROVEMENT  
LOANS ACT LIBERALIZED:

A more liberal policy in granting loans to fishermen under provision of the Fishermen's Improvement Loans Act of 1955 was announced in mid-1965 in the House of Commons by Canada's Minister of Fisheries.

The Act was established to provide for long-term, low-interest loans to fishermen for the purchase or improvement of vessels, equipment, or materials used in their fishing enterprise. The latest amendments to the Act raised the borrowing power of a fisherman from the former C\$4,000 to a new ceiling

of \$10,000. The repayment period has been extended to 10 years from the former maximum of 8 years and the interest rate remains unchanged at 5 percent. The Act has been extended for another 5 years until June 30, 1970. (Canadian Department of Fisheries, Vancouver, August 4, 1965.)

\* \* \* \* \*

SEAWEED PROCESSING PLANT  
FOR PRINCE EDWARD ISLAND:

Establishment of an experimental seaweed processing plant at Miminegash, Prince Edward Island, was announced July 30, 1965, by the Canadian Fisheries Minister and Minister of Mines and Technical Surveys. The plant, which will process Irish moss and other types of seaweed, will be operated by the Industrial Development Service of the Federal Department of Fisheries. About a dozen people will be employed during the summer season, with a smaller staff during the rest of the year.

The Department of Public Works will construct a wharf and a 60 x 100-foot building at Miminegash. Part of the equipment will be a mechanical dryer for Irish moss and other seaweeds.

In its initial stages, the work carried out at the plant will involve harvesting, cleaning and preliminary processing, and experiments with weeds at various stages of their life cycles. The end product of the plant will be ready for the final extraction of alginate and carrageenin, which are used as stabilizers for products such as ice cream, jellies, pharmaceutical products, cosmetics, beer, and tooth paste. (Canadian Department of Fisheries, July 30, 1965.)

\* \* \* \* \*

SALTED FISH FOR DISTRIBUTION TO  
COUNTRIES SUFFERING FOOD SHORTAGE:

It was reported this past summer that the Canadian Government had authorized the Fisheries Supply Board to purchase a supply of Nova Scotia-produced salted fish from 1964 production to be distributed as a Canadian relief measure to troubled parts of the world where a food shortage exists. The cost of the purchase was put at \$310,000.

The fish was originally destined for the Dominican Republic, according to the Canadian press, but got no farther than Halifax when the market was affected as a result of politi-

## Canada (Contd.):

cal disturbances in that Caribbean Island. An official of the Fisheries Support Board informed the press that the fish would not necessarily be handed over to the Dominican Republic, although he pointed out that some of it might eventually find its way there. Disposition of the fish was placed in the hands of the Canadian Department of External Affairs and the World Food Program.

The Canadian Salt Fish Exporters Association said the political situation in the Caribbean area had been hurting salt fish exporters.



## Ceylon

NEW HARBORS FOR FISHING  
VESSELS PLANNED:

The Ceylon Fisheries Corporation, a State-owned organization, proposes to build 34 fisheries harbors and has called for bids on preliminary survey work.

The proposed harbors would include 2 Grade A" harbors with a draft of 20-25 feet for offshore tuna vessels and trawlers; 12 "Grade B" harbors with a draft of 10-12 feet for coastal vessels; and 20 "Grade C" harbors with a draft of 6-7 feet for small craft.

The preliminary investigations will consist of: (1) a complete hydrographic survey; (2) studies of the sediment transport and littoral drift; (3) measurement of wind and waves; and (4) soil and subsoil investigations.

The Ceylon Fisheries Corporation estimates that the expenditure on the investigations will amount to about Rs. 3 million (US\$630,500) and that the investigations, harbor designs, and other work should be completed within 3 years. (United States Embassy, Colombo, August 20, 1965.)



## Chile

RELIEF MEASURES APPROVED FOR  
DEPRESSED FISH MEAL INDUSTRY:

With a prolonged anchoveta shortage causing a severe crisis in the Chilean fish meal

industry, the Production Development Corporation of Chile (CORFO) has authorized the following relief measures:

- (1) moratorium on certain debts of vessel and plant owners;
- (2) subsidy payments to anchoveta seiners;
- (3) payment of part of the export bonus provided in the Fisheries Law.

While giving some relief, those measures will not solve the basic problem created by the anchoveta shortage. A statistical analysis indicates that the annual anchoveta catch needed to sustain the Chilean fish meal plants and fleet at the break-even point is 1.9 and 1.4 million tons, respectively. By contrast, the record anchoveta catch of 1964 amounted to only 0.9 million tons.

The most critical period for the Chilean fish meal industry is expected in December when the main anchoveta fishing season traditionally begins. If anchoveta return in sufficient number, the industry may yet recover and fulfill the hopes of its developers. (United States Embassy, Santiago, July 27, 1965.)

Note: See Commercial Fisheries Review, Sept. 1965 p. 59.

\* \* \* \* \*

## JAPANESE JOINT WHALING VENTURE:

A Japanese whaling company was scheduled to conduct a joint whaling venture in Chile in fall 1965 with a Chilean firm for the second consecutive year under an agreement concluded in 1964. The Japanese firm has filed a license application with the Fisheries Agency to operate a fleet of 5 whale catchers and 1 freezer factoryship off Chile from September 1965.

Under the joint venture agreement, the Japanese firm will sell its whale catch to the Chilean firm for processing, and repurchase about 8,000 metric tons of frozen whale meat for shipment to Japan. Catch target--480 baleen whales. (Suisan Keizai Shimbun, July 23, 1965.)



## Cuba

### SOVIET-CUBAN FISHERY AND OCEANOGRAPHIC RESEARCH IN GULF OF MEXICO AND CARIBBEAN:

In July 1964, a Joint Soviet-Cuban Oceanographic and Fishery Expedition was organized for work in the Gulf of Mexico and the Caribbean Sea. The authority for the research program was granted under an agreement on technical and scientific cooperation concluded between the Soviet Academy of Sciences and the Cuban Academy of Sciences earlier in 1964. In addition to those two organizations, several other Cuban and Soviet scientific institutes collaborated.

The two Soviet research vessels participating were Akademik A. Kovalevskii, with 22 scientists, and Mikhail Lomonosov with over 60 scientists. The first vessel conducted biological, hydrochemical, and hydrogeological studies on the Continental Shelf near Cuba, in the vicinity of the Campeche Banks off Mexico, and off the west coast of Florida; it also investigated deep-sea areas adjacent to the Antilles and the Bahamas. Biological samples and data obtained at sea were studied aboard the vessel and in the laboratories of the Cuban Marine Biological Institute (affiliated with the Cuban Academy of Sciences). Cuban biologists from the Institute, several of them women, participated in the Kovalevskii's 9 research cruises, each of which lasted about 1 month. The Soviet oceanographic research vessel Lomonosov participated in only one cruise. The Lomonosov brought a delegation of Soviet scientists to attend the dedication at Havana of the Cuban Oceanographic Institute, which contains 28 laboratories with modern scientific equipment and provides working facilities for over 100 Cuban and Soviet marine scientists.

In addition, two Cuban research vessels, the Delfin and the Fidias, also conducted investigations coordinated with the overall research plan. (The Delfin, a tuna clipper, was bought from Japan along with 4 other tuna vessels in 1962.)

Soviet and Cuban marine scientists discovered new fishing grounds and planned ways to catch more crab, lobster, and shrimp. Maps of new fishing areas indicating the distribution and concentrations of various species were made. Oceanographers obtained data on the geomorphology and geological structure of sea bottom off Cuba. Most of the

practical information was turned over to Cuba when field research was completed in mid-August 1965. The scientific information collected will continue to be analyzed in Cuban and Soviet institutes for several years.

Note: See Commercial Fisheries Review, April 1964 p. 66.



## Denmark

### EXPORTS OF FISHERY PRODUCTS AND BYPRODUCTS, JANUARY-JUNE 1965:

Exports to All Countries: Denmark's total exports of fishery products and byproducts to all countries in the first half of 1965 amounted to 167,086 metric tons valued at 372 million kroner (US\$53.9 million). As compared with the same period in 1964 this was an increase of 8 percent in quantity and 22 percent in value. The export value of fresh and frozen fishery products--the two most important categories--was up 11 percent and 25 percent, respectively, although the quantities were almost the same as in the same period of 1964. In 1965, higher prices were received for species such as cod, herring, and plaice. Pond trout production in 1965 expanded at a faster rate than the export market could absorb and as a result prices were lower.

Table 1 - Danish Fishery Products Exports to all Countries, January-June 1965

Product	1/January-June 1965			January-June 1964		
	Qty.	Value		Qty.	Value	
	Metric Tons	1,000 Kr.	US\$ 1,000	Metric Tons	1,000 Kr.	US\$ 1,000
<b>Fresh, Frozen, &amp; Cured:</b>						
Fresh fish . . .	93,386	179,773	26,067	94,231	162,368	23,543
Frozen " . . .	24,601	105,838	15,347	24,641	84,340	12,229
Salted " . . .	2,482	10,951	1,588	1,683	6,319	916
Smoked " . . .	354	5,272	764	297	4,414	640
<b>Canned Products:</b>						
Fish . . . . .	3,023	11,718	1,699	2,918	10,825	1,570
Shellfish . . .	931	7,499	1,087	609	4,565	662
<b>Semipreserved Products:</b>						
Fish . . . . .	909	6,032	875	695	4,158	603
Shellfish . . .	468	3,363	488	434	2,562	372
<b>Other Products:</b>						
Fish meal, solubles, ensilage, and trout food	40,932	41,744	6,053	29,064	25,739	3,732
<b>Total . . . .</b>	<b>167,086</b>	<b>372,190</b>	<b>53,968</b>	<b>154,572</b>	<b>305,290</b>	<b>44,267</b>
	January-May 1965			January-May 1964		
Fish oil <sup>2/</sup> . . . .	18,074	23,318	3,381	11,015	12,994	1,877

<sup>1/</sup>Preliminary data from Ministry of Fisheries.

<sup>2/</sup>Fish oil data are shown separately because they are collected by another Ministry and often are delayed.

Note: One Danish krone equals US\$0.145.

Exports of fish meal and fish oil during the period were higher both in quantity and value, particularly fish oil because of higher international market prices.

## Denmark (Contd.):

Table 2 - Value of Danish Fishery Products Exports by Economic and Major Countries, January-June 1965				
Destination	1/ January-June 1965		January-June 1964	
	Value		Value	
	1,000 Kr.	US\$ 1,000	1,000 Kr.	US\$ 1,000
By Economic Groups:				
Common Market (EEC) . .	155,000	22,475	131,000	18,995
European Free Trade Assn. (EFTA - including Finland) . . . .	166,000	24,070	126,000	18,270
East Bloc countries . . . .	14,000	2,030	12,000	1,740
Other countries . . . . .	38,000	5,510	36,000	5,220
Total . . . . .	373,000	54,085	305,000	44,225
Major Importers by Country:				
West Germany . . . . .	100,000	14,500	81,000	11,745
United Kingdom . . . . .	70,000	10,150	58,000	8,410
Sweden . . . . .	58,000	8,410	40,000	5,800
Italy . . . . .	24,000	3,480	22,000	3,190
Switzerland . . . . .	25,000	3,625	20,000	2,900
United States . . . . .	19,000	2,755	14,000	2,023
1/Preliminary.				

**Exports to the United States:** Exports of Danish fishery products to the United States rose 44 percent in quantity and 36 percent in value during the first half of 1965 as compared with the same period in the previous year. Exports of cod fillets, mostly as frozen fish blocks, were up 46 percent in quantity and 85 percent in value and accounted for more than half the exports to the United States. More pond trout and canned herring went to the United States than in the same pe-

riod of 1964 but exports of flatfish and Norway lobster were lower. Increased pond trout production during the period helped Danish trout producers meet competition in the United States market from Japanese trout producers and to recover some of the trade lost in 1964.

**Exports to Economic Groups and Major Countries:** The EFTA trading partners of Denmark superseded the Common Market (EEC) as the leading market for Danish fishery products in the second quarter of 1965 after the Common Market led narrowly in the first quarter of the year. The EFTA (including Finland) increased the value of its imports by 32 percent as compared with the first half of 1964 and by 9 percent over the first quarter of 1965. For the Common Market the increase was 18 percent over the first half of 1964, but 6 percent less than the first quarter of 1965.

In the first half of 1965, West Germany maintained its substantial margin as the leading importing country, 43 percent more than the United Kingdom, the next largest importer. Swedish imports increased 45 percent. Switzerland, Italy, and the United States also increased their imports of Danish fishery products in the first half of 1965. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, July 21, 1965.)

Note: See *Commercial Fisheries Review*, Aug. 1965 p. 70; July 1965 p. 64; Oct. 1964 pp. 53-55.

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Table 3 - Danish Fishery Products Exports to the United States, January-June 1965

Product	1/ January-June 1965			January-June 1964		
	Qty.	Value		Qty.	Value	
		Metric Tons	1,000 Kr.		Metric Tons	1,000 Kr.
<b>Fresh &amp; frozen:</b>						
Fillets:						
Cod	2,648	10,544	1,529	1,811	5,702	827
Other fillets	11	54	8	85	370	54
Pond trout	359	2,182	316	226	1,784	259
Flatfish 2/	106	1,003	145	164	1,414	205
Norway lobster	47	1,129	164	107	2,020	293
Other	52	581	84	1	75	10
<b>Cured products:</b>						
Salted & smoked 3/	6	44	6	21	77	11
<b>Canned products:</b>						
Herring & sprat	342	1,593	232	269	1,282	186
Shrimp	60	598	87	67	664	96
Mussels	67	298	43	31	177	26
Other	11	68	10	10	58	8
<b>Semipreserved products:</b>						
Fish solubles	16	189	27	8	95	14
	450	468	68	100	96	14
<b>Total exports to U. S.</b>	<b>4,175</b>	<b>18,751</b>	<b>2,719</b>	<b>2,900</b>	<b>13,814</b>	<b>2,003</b>
1/ Preliminary data from Ministry of Fisheries.						
2/ Mostly turbot, brill, plaice, and sole.						
3/ Mostly cod, salmon, other trout, eels.						

# FISHERY TRENDS, JANUARY-JUNE 1965:

**Landings:** Fishery landings in local ports by Danish vessels during the first half of 1965 were up 19 percent from the same period in 1964 because of substantially higher landings of industrial fish, especially sand eels. Danish fishermen caught greater quantities of cod, herring, shrimp, and cod-like species, but catches of flatfish, brisling, and mackerel were lower. Foreign vessels, mainly Swedish, landed only slightly more fish in Danish ports than in the first 6 months of 1964. Danish direct landings in foreign ports, mostly British, were down considerably because of delays encountered in landing their catches.

Ex-vessel prices were generally high in January-June 1965. Plaice prices were maintained at high levels because two of Eu-

## Denmark (Contd.):

rope's largest fish firms competed for supplies. Independent Danish producers and exporters of frozen plaice fillets had some difficulty in obtaining supplies to meet their needs.

Table 1 - Danish Fishery Landings, January-June 1965 with Comparisons

Species	January-June	
	1965	1964
.. (Metric Tons).		
<b>Landings in Denmark</b>		
<b>by Danish vessels:</b>		
Flatfish 1/	26,780	32,257
Cod	46,709	42,258
Cod-like fish 2/	26,360	17,665
Herring	130,261	117,547
Brisling	1,642	4,071
Mackerel	2,514	2,958
Eels	478	546
Salmon	714	558
Pond trout	5,156	4,236
Other fish 3/	154,300	109,110
Norway lobster	733	1,015
Shrimp	2,880	2,050
Mussels	8,223	7,965
Other shellfish	1,766	2,228
<b>Total</b>	<b>408,516</b>	<b>344,464</b>
<b>Landings in Denmark</b>		
<b>by foreign vessels</b>		
	90,186	88,513
<b>Total landings in Danish</b>	<b>498,702</b>	<b>432,977</b>
<b>ports</b>		
<b>Landings in foreign ports</b>		
<b>by Danish vessels</b>	1,669	2,831
1/Plaice, flounder, dab, common sole, etc.		
2/Haddock, coalfish, hake, ling, etc.		
3/Mostly industrial fish such as sand eels, Norway pout, etc.		

The record production of pond trout in the first half of 1965 resulted from improved operations, including the use of dry feed. This resulted in lower prices as Danish exporters were unable to increase sales of pond trout. Danish pond trout producers became the first industry segment to seek assistance through the recently passed minimum fish export price legislation which became effective July 1, 1965.

**Processing:** Production of most processed items was higher during the first half of 1965

Table 2 - Danish Production of Processed Fishery Products, January-June 1965

Product	January-June	
	1965	1964
.. (Metric Tons).		
<b>Canned:</b>		
Herring & sprats	1,542	1,901
Mackerel	496	325
Other fish	2,948	3,011
Mussels	301	258
Other shellfish	776	582
<b>Total</b>	<b>6,063</b>	<b>6,077</b>

(Table continued in next column.)

Product	January-June	
	1965	1964
.. (Metric Tons).		
<b>Semi-preserved:</b>		
Herring & sprats	2,758	2,246
Other fish	237	224
Mussels	360	318
<b>Total</b>	<b>3,355</b>	<b>2,788</b>
<b>Fresh &amp; frozen fillets:</b>		
Cod	16,449	14,138
Cod-like fish 1/	1,732	758
Plaice	7,752	7,152
Other flatfish	1,002	486
Herring	24,257	16,603
Other fish	102	132
<b>Total</b>	<b>51,294</b>	<b>39,269</b>
<b>Smoked:</b>		
Herring & sprats	826	822
Mackerel	713	662
Eels	303	341
Salmon & trout	374	222
Other fish & shellfish	169	121
<b>Total</b>	<b>2,385</b>	<b>2,168</b>
<b>Miscellaneous:</b>		
Porc meat 2/	992	772
Salted herring	14	11
Dry-salted cod	158	394
Other fishery products	844	3,790
<b>Total</b>	<b>2,008</b>	<b>4,967</b>
<b>Industrial products:</b>		
Meal	54,735	39,582
Oil	13,629	10,555
Ensilage 3/	2,308	3,018
Solubles	7,353	4,905
<b>Total</b>	<b>78,025</b>	<b>58,060</b>

1/Haddock, coalfish, hake, ling, etc.  
2/Ground fish, milk, and flour.  
3/Chemically treated raw fish.  
Source: Ministry of Fisheries.

than in 1964 because of increased export demand. The larger increase was in the fresh and frozen fillet category which was up 30 percent as more cod, herring, and plaice were filleted. Larger landings of herring and sand eels in the first half of 1965 increased the production of fish meal, solubles, and oil considerably. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, July 27, 1965.)

Note: See Commercial Fisheries Review, July 1965 p. 64; Oct. 1964 pp. 53-55.

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### SURPLUS SUPPLIES OF POND TROUT FOR EXPORT REDUCED:

The surplus of about 2.2 million pounds of Danish pond trout reported by producers in Denmark in July 1965 later appeared to no longer be a problem. This was according to reports from the August 11, 1965, extraordinary general meeting of Dansk Andels Ørredesport, a cooperative that produces and sells about 45 percent of the Danish pond trout. But cooperation throughout the industry is necessary to stabilize prices. In an effort to achieve such cooperation, it was urged that there be a meeting of all Danish pond trout producers on August 30, 1965, in



## Denmark (Contd.):

Brande where the cooperative has a modern trout-processing plant.

At the August 11 meeting, members of the cooperative were informed of the results of operations during the first 6 months of 1965. It was stated that the average price paid for pond trout to members during that period was 4.02 kroner a kilo (26.4 U. S. cents a pound) with about 0.50 kroner a kilo (7.25 cents a pound) available for later payment, or a total of about 33.69 cents a pound.

A July 20 meeting of trout producers and exporters with the Fisheries Ministry to request establishment of minimum export prices did not bring any results. The Fisheries Minister pointed out he could not act until the two associations--Trout Producers Association of 1965 and the Danish Trout Exporters Association--were in agreement on (1) what steps they wished taken under the provisions of the new export legislation, and (2) a joint representative on the Export Committee provided for in the law.

At a later meeting of the association, it was reported that the prospects for establishment of a single organization appeared good. There was sentiment for a suggested export price initially, to be followed later by prices established on a broader basis. Agreement had not been reached, however, on the operation of a minimum price pool. Most believed that producers with a surplus which could not be sold at minimum prices could only be reimbursed at lower than minimum prices in order to preclude unlimited overproduction. A few still were not sure this loss was unavoidable. Meanwhile another meeting of the associations was expected soon.

Denmark's exports of pond trout during the first 6 months of 1965 amounted to 5,100 metric tons (11.2 million pounds) valued at 37.2 million kroner (US\$5.4 million), up 24 percent in quantity and 12 percent in value as compared with the same period in 1964. Exports to the United States in the first half of 1965 totaled 791,000 pounds valued at \$316,000, an increase of 59 percent in quantity and 22 percent in value as compared with 1964. The total pond trout export data show a loss of about 10 percent in average prices from 1964 to 1965, while those for exports to the United States show a loss of about 23 percent. The United States imports only frozen

pond trout from Denmark while other countries receive live, fresh, and frozen pond trout. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, August 13, 1965.)

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#### NEW FISHERIES LAWS ON FISHING LIMITS, EXPORTS, AND QUALITY:

Three new Danish laws affecting the catching, quality, and exporting of fish and fishery products became effective July 1, 1965. They do not apply in the Faroe Islands or Greenland, except that most of the quality control law applies in Greenland.

Salt-Water Fisheries Law: The new law, which brings up to date 1951 legislation, applies to all Danish fishery waters except those covered by the fresh-water fisheries law. It authorizes an extension of Danish fishery waters in the North Sea, Skagerrak, and Kattegat to 12 nautical miles from the base line of the territorial sea. The extension to 12 miles will not become effective until proclaimed by the Fisheries Minister. As of mid-August 1965, Denmark had not extended its fishing limits. Discussions were still being held with Norway over fishing rights in the area that would be affected by the extension.

Under the new law, only Danish citizens, organizations controlled by Danish citizens, or residents of Denmark for the last 2 years may (1) conduct fisheries in Danish waters, or (2) process or transfer fish within Danish fisheries limits, or (3) transport fish or fishery products directly from the sea through Danish fishery waters to Danish ports. Vessels used in such operations must be Danish and two-thirds of the crew must be Danish citizens or 2-year residents. But exceptions to those rules may be made by the Fisheries Minister in the interest of fisheries development, or as a result of agreements with other countries.

Minimum legal sizes for salt-water species are specified in the new law.

Most violations of the law, including those by foreign vessels, are punishable by fines, although gear and catch may be confiscated in certain cases.

Each fisherman is required to supply the Fisheries Ministry with information about his vessel, gear, catch, and sales.

### Denmark (Contd.):

The law became effective July 1, 1965 but does not apply in Greenland or the Faroe Islands.

Export of Fish and Fishery Products Law: This new law was enacted at the request of the fishing industry to provide a means for correcting difficulties arising from export surpluses--especially for pond trout and herring.

The new law provides that the Fisheries Minister may establish minimum fishery export prices after a request by a representative fisheries association and review by an appointed Export Committee. Exporters guilty of gross or frequent violations of the export regulations may have their permission to export fishery products withdrawn.

The first attempt to use the law was made by an association of pond trout producers. Their request was denied by the Fisheries Minister because it was not supported by a group of pond trout exporters, and no trout industry representative had been agreed upon for the Export Committee. The two trout associations have met to reconcile their differences.

The law became effective July 1, 1965, but does not apply in Greenland or the Faroe Islands.

Quality Control of Fish and Fish Products Law: This legislation replaces the May 11, 1954, law on the same subject. The new law had general industry and Government support as a means of maintaining or improving the reputation of Danish fish for high quality. Its enactment updates definitions, regulations, techniques, and methods described in the earlier legislation. In general, it maintains or expands provisions of general interest while omitting the detailed regulations which are subject to frequent change because of industry developments. The Fisheries Minister has been authorized to establish the latter type of regulations administratively. They include the detailed rules for handling fish on shipboard and ashore, transportation, processing plants, packaging, and labeling.

The law applies to domestic fish production and processing, and to exported and imported fish and fishery products. It covers both food and industrial fish and also includes foods prepared for feeding fish. (The latter products

are important in Denmark because of the large pond trout industry). Inspections relating to law enforcement are functions of the Fisheries Ministry's Control and Inspection Services. A Quality Committee, consisting of 6 industry representatives and one each from the National Health Service and the Fisheries Ministry, function as directed by the Fisheries Minister. The Minister may also require submission of information on the production and disposition of fish and fishery products.

The law became effective July 1, 1965, in Denmark and Greenland. The law is not effective in the Faroe Islands. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, August 18 and 19, 1965.)  
Note: See Commercial Fisheries Review, Sept. 1965 p. 59.



### France

#### FISH MEAL AND OIL PRODUCTION AND IMPORTS, 1964:

Production of fish meal in France during 1964 totaled an estimated 12,000 metric tons as against an estimated 8,000 tons in 1963. Production, which is concentrated along the northern coast, is based mainly upon offal and waste from the preparation of fish for human consumption. France is largely dependent on fish meal imports to satisfy its requirements. Imports of fish meal in 1964 totaled 104,835 tons as against 76,512 tons in 1963.

Production of cod oil in 1964 amounted to 3,321 tons compared with 1,188 tons in 1963. Production of other types of marine oil in France is reported to be insignificant. French needs for fish oil are met by imports, which totaled 29,289 tons in 1964 compared with 29,990 tons in 1963. (U. S. Department of Agriculture, August 2, 1965.)



### Iceland

#### EXPORTS OF FISHERY PRODUCTS, JANUARY-MARCH 1965:

During January-March 1965, there was an increase in exports of salted fish, salted fish fillets, stockfish, canned fish, frozen herring, and herring oil, as compared with the same period in 1964, according to the Icelandic Statistical Bulletin, May 1965. Exports of fro-

## Iceland (Contd.):

Icelandic Fishery Exports, January-March 1965 with Comparisons						
Product	Jan.-Mar. 1965			Jan.-Mar. 1964		
	Qty.	Value f.o.b.		Qty.	Value f.o.b.	
	Metric Tons	1,000 Kr.	US\$ 1,000	Metric Tons	1,000 Kr.	US\$ 1,000
Salted fish, dried	1,494	30,371	705	535	13,714	318
Salted fish, uncured	2,430	41,870	971	2,067	32,976	765
Salted fish fillets	798	14,002	325	463	6,703	158
Wings, salted	74	1,031	24	219	2,837	68
Stockfish	3,015	88,470	2,053	2,390	68,920	1,597
Herring on ice	-	-	-	19	140	3
Other fish on ice	11,061	62,957	1,461	10,303	58,710	1,362
Herring, frozen	8,323	53,525	1,242	7,721	45,987	1,067
Other frozen fish, whole	1,562	18,897	438	792	8,773	204
Frozen fish fillets	9,177	217,159	5,038	11,832	252,282	5,853
Shrimp and lobster, frozen	102	10,441	242	165	16,022	372
Roes, frozen	284	4,993	116	316	6,831	158
Canned fish	191	8,613	200	45	2,235	52
Cod-liver oil	1,195	13,059	303	1,351	12,536	291
Lumpfish roes, salted	-	-	-	3	81	2
Other roes for food, salted	124	1,940	45	981	15,195	353
Roes for bait, salted	-	-	-	-	-	-
Herring, salted	7,874	81,722	1,896	13,905	138,314	3,209
Herring oil	9,494	79,602	1,847	4,807	38,233	887
Ocean perch oil	-	-	-	28	188	4
Whale oil	774	6,698	155	2,101	18,675	433
Fish meal	4,056	26,442	613	5,486	29,429	683
Herring meal	23,262	159,804	3,707	26,564	149,237	3,462
Ocean perch meal	-	-	-	109	621	14
Wastes of fish, frozen	620	2,090	48	257	1,081	25
Liver meal	174	1,233	29	143	943	22
Lobster and shrimp meal	25	124	3	87	346	8
Whale meal	311	1,889	44	630	3,514	82
Whale meat, frozen	106	892	23	49	378	9

Note: Values converted at rate of 1 krona equals 2.32 U. S. cents.

zen fish fillets, salted herring, whale oil, fish meal, herring meal, and whale meal showed a considerable decrease in the first 3 months of 1965.

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#### MINIMUM EX-VESSEL SUMMER HERRING PRICES IN 1965:

For the 1965 summer fishery, the Icelandic Price Control Board established one series of minimum ex-vessel prices for the north and east coast, and another price series for the south and west coast.

North and East Coast: In this area, minimum ex-vessel herring prices from June 10 to September 30, 1965, were as follows:

Herring for freezing and salting Kr. 257 (US\$5.97) per barrel (120 liters which is about 32 gallons or 245 pounds). For a fully salted barrel of herring, the minimum price was Kr. 350 (\$8.13).

Herring for reduction Kr. 235 (\$5.46) per mal (150 liters which is about 40 gallons or 310 pounds), less an assessment of Kr. 3 (7 U. S. cents) for the Herring Transport Fund. For transporting herring to the north coast when the east coast reduction factories are full, fishing vessels receive an additional Kr. 25 (58 cents) per mal of which 60 percent is paid by the Transport Fund and the remainder by the receiving factory.

South and West Coast (Hornafjordur west to Rit): Minimum prices in this area from June 16 to September 10, 1965, were:

Herring for reduction Kr. 1.4 per kilo (1.47 cents per pound).

Herring for freezing, salting, or filleting Kr. 1.65 per kilo (1.74 cents per pound).

Herring for canning Kr. 1.5 per kilo (1.58 cents per pound).

The Government of Iceland has told vessel owners that 1966 herring prices in all areas will be based on weight rather than quantity. (United States Embassy, Reykjavik, July 21, 1965.)



#### Italy

#### FISHERY MARKET TRENDS:

About half the total amount of fish consumed in Italy each year is supplied by the domestic fishing industry. For the past few years, production in that country has remained stable at about 200,000 metric tons a year but consumption has increased from 369,000 tons in 1961 to 394,000 in 1963. Italy's per capita consumption of fishery products, at 16.7 pounds in 1963, was well below the world average of 24 pounds.

Anchovies, sardines, molluscs, crustacean, and mackerel account for about 70 percent of the total yearly Italian catch, almost all of which is sold fresh. Tuna, which previously accounted for a small percentage of the total catch is now being sought on a large scale to satisfy the ever-growing demand. This is reflected in the recent transformation of the Italian fishing fleet.

From 1961 to 1963, the Italian motorized fishing fleet increased from 10 units in the 200- to 500-ton category to 28, from 2 units in the 500- to 1,000-ton category to 15, and from 3 units to 5 for vessels over 1,000 tons. Toward the end of 1964, 18 vessels of the 500- to 1,000-ton type and 4 over 1,000 tons were being built and were due for completion.

Over the past few years, imports of fish--fresh, frozen, and refrigerated (chilled)--have increased steadily, mainly because of the growing popularity of tuna. Italy imports frozen tuna which is canned and preserved in olive oil.

### Italy (Contd.):

Italy traditionally imports canned salmon and salted cod from Canada. In 1963, Italy's imports of canned salmon from Canada increased rather sharply because Canadian prices were more competitive. For salmon, Italy is a price market and stronger competition from Japan, and especially the Soviet Union makes it more and more difficult for Canadian exporters to sell in the Italian market.

Italy's imports of salted cod from Canada have been rather limited because of the higher standard of living in Italy and better freezing facilities. Italy's imports of salted cod totaled about 1,000 metric tons in 1964. That market is always open to good quality low-priced salted cod. (Foreign Trade, Canadian Department of Trade and Commerce, Ottawa, August 7, 1965.)

Note: See Commercial Fisheries Review, April 1965 p. 59; March 1965 p. 63.



### Ivory Coast

#### FISHERY TRENDS IN 1964:

Fishery landings in the African State of Ivory Coast in 1964 totaled 38,116 metric tons, a 26-percent increase over the 30,000 tons landed in 1963. These were by the Abidjan-based commercial fishing fleet made up of 31 trawlers, 35 seiners, and 4 tuna vessels. Principal species were sardines and herring which accounted for about half the total landings, some tuna, and other miscellaneous species.

In addition and not included in the landings as reported by the Ivory Coast Fisheries Service, an estimated 6,500 tons of tuna was transshipped from Abidjan in 1964 to canneries in Europe and Puerto Rico. This compares with tuna transshipments of 5,500 tons in 1963.

Heaviest landings during 1964 were in October-November when over 4,000 tons were caught in each of those months. The months of lightest landings were in June and February when the catch totaled 2,500 tons for each month.

The year 1964 saw the opening of the first phase of an ambitious program of fishery development planned for the future. This was the 1,300-foot dock and fuel facility at the new

"Port de Peche" (Fishing Port) which is now in full operation. The construction of a new 3,000-ton storage capacity freezer plant is planned, with construction to start in late 1965. Other plans include another 1,300-foot extension of the dock, a tuna cannery, a fish meal plant, a can-making plant, and a frozen fish-distribution system extending into the interior of the country. (Regional Fisheries Attache for Africa, United States Embassy, Abidjan, May 8, 1965.)

Note: See Commercial Fisheries Review, July 1965 p. 68; March 1965 p. 75; October 1964 p. 60.



### Jamaica

#### FISHERIES SITUATION:

The fisheries of Jamaica are underdeveloped and fall far short of supplying domestic needs. Imports fill the gap. Those imports in 1964 included 16.8 million pounds of dried salted cod, mostly from Canada. The 1964 imports also included canned fishery products valued at US\$18.6 million over 75 percent of which came from Canada. Canned products displayed by Jamaican super-markets include salmon, mackerel, sardines, and herring from Canada, sardines from the United States, and tuna from Peru.

Jamaican Retail Prices of Canned Fish		
Product	Can Size	U.S. Cents
<b>Salmon (all from Canada):</b>		
Pink	15½-oz. tall	67 to 77
	7½-oz.	35 to 42
Cohoe	15½-oz. tall	107
	7½-oz.	64
Red	7½-oz.	70
<b>Mackerel:</b>		
Canadian	15-oz. tall	28
Japanese	7½-oz.	18
<b>Sardines:</b>		
California:	5-oz., tomato	12½
	5-oz., chile	14
	7½-oz., oval	18
Japanese		
Canadian (Atlantic) herring	7-oz., oval	18
<b>Tuna (Peru):</b>		
Solid pack	7-oz.	25
	6½-oz.	27
Chunks		

Jamaica probably has more than sufficient fishery resources to supply its domestic needs. Abundant supplies of bottomfish have been found on nearby banks by the exploratory ves-

## Jamaica (Contd.):

sel Blue Fin operated by the Fisheries Division of the Jamaican Government. Since those banks are coral, the Fisheries Division has encouraged the development of pot or trap fishing. That method and beach seining are the two most common types of fishing in the area.



Fig. 1 - Port Royal, Jamaica, fishermen use these canoes to fish with traps and beach seines.

Dependence on a fishing fleet of dugout canoes is one of the main factors limiting Jamaican fishermen. The Fisheries Division is administering a scheme to finance outboard motors for the canoe fishermen, but change comes slowly. The advantages of modernization are illustrated by a progressive group of pot fishermen based at Whitehorse. With mechanization, they are able to fish a large and reportedly productive area about 90 miles offshore.



Fig. 2 - There is a beach seine fishery out of Greenwich Fishing Beach, Kingston, Jamaica. Nets are used in Kingston Bay and nearby ocean beaches.

Since trawling has never proven successful, there seems to be no possibility of developing a sizable shrimp fishery. The canoe fishermen catch a few shrimp for which they are paid as much as 70 to 80 U.S. cents a pound, heads on. Frozen shrimp are actually

imported from the United States in small quantities. But there are prospects for developing and expanding a spiny lobster fishery. Jamaica is already exporting a small quantity of spiny lobsters. Domestic demand is satisfied by the local fishermen. They receive 40 to 60 U.S. cents a pound, depending on the seasonal abundance. If developed, the lobster fishery may be capable of expansion.



Fig. 3 - At Greenwich Fishing Beach, a beach-seine canoe has landed and is surrounded by buyers and fishermen.

Recent developments in Jamaican fisheries include a Government-sponsored pilot project in herring canning that was begun early in 1965. The project is located on the southeastern end of St. Thomas. The results are not yet available.

An experimental fishermen's cooperative has been established at Port Royal where a large canoe fleet is based. The organization seems to be doing a good job of getting fishing supplies for its members, but it has not yet developed market outlets as was hoped.



Fig. 4 - Beach seines drying at Greenwich Fishing Beach. Shacks are used for working on nets.

Looking to the future, Jamaica plans to participate in the development program for Caribbean fisheries sponsored by the Food and Agriculture Organization of the United Nations. (United States Embassy, Kingston, July 22, 1965.)



## Japan

### EXPORT VALIDATIONS OF FROZEN TUNA AND TUNA LOINS BY COUNTRY, APRIL-MAY 1965:

Japan's export validations of frozen tuna and cooked frozen tuna loins validated for export to all countries in April-May 1965 were up 29 percent from the same period in 1964.

Japan's Export Validations of Frozen Tuna and Tuna Loins by Country of Destination, April-May 1965

Item	To U.S. & Canada		To Other Countries		Total	
	May	Apr.-May	May	Apr.-May	May	Apr.-May
(Short Tons)						
Albacore, round	5,848	6,532	1,010	2,573	6,858	9,105
Yellowfin:						
Round	556	650	-	-	556	650
Gilled & gutted:						
20/100 lbs.	3,478	6,466	1,004	1,397	4,482	7,863
100 lbs. up	522	676	-	-	522	676
Drzd. with tail	1,025	1,887	5,333	9,102	6,358	10,989
Fillets	-	2	1	-	1	2
Total	5,581	9,681	6,338	10,499	11,919	20,180
Big-eyed:						
Dressed	53	135	1,062	2,612	1,115	2,747
Other	-	12	320	320	320	332
Total	53	147	1,382	2,932	1,435	3,079
Skipjack	1,450	2,106	-	-	1,450	2,106
Bluefin:						
Dressed	-	-	734	835	734	835
Fillets	-	-	181	181	181	181
Total	-	-	915	1,016	915	1,016
Loins:						
Albacore	50	225	-	-	50	225
Yellowfin	87	602	-	-	87	602
Total	137	827	-	-	137	827
Grand total 1965	13,069	19,293	9,645	17,020	22,714	36,313
Grand total 1964	7,736	17,091	6,048	11,053	13,784	28,144

Exports of 19,293 short tons validated for the United States and Canada in April-May 1965 included 334 tons shipped from American Samoa and other Japanese bases (Fiji Islands, New Hebrides, and Penang in Malaysia) in the South Pacific. (Fisheries Attache, United States Embassy, Tokyo, July 27, 1965.)

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### SKIPJACK TUNA FISHING SLOW:

Japanese skipjack tuna fishing continued poor since the season's outset, with catches off the Ogasawara Islands (south of Tokyo Bay) running negligible early in August 1965 due to the effect of a cold water mass. As a result, the ex-vessel skipjack price rose to over 80 yen a kilogram (US\$202 a short ton). Cannermen in Shizuoka Prefecture claim they cannot make any profit at that price and many are switching to peach canning. A few cannermen in Yaizu (Shizuoka Prefecture) who primarily pack tuna in oil are reported buying skipjack at 83-86 yen a kilogram (\$209-217 a

short ton) in hopes that prices may rise by 50-100 yen (\$0.14-0.28) a case.

Japanese trading firms are reported offering 1,450 yen (\$4.03) a case for skipjack tuna in oil packed in 3.5-oz. cans and 2,450 yen (\$6.81) a case for the 7-oz. pack, but due to higher prices asked by cannermen to offset increased production costs, actual sales are being transacted at around 1,550 yen (\$4.31) for the smaller pack and 2,550 yen (\$7.09) for the larger pack. (Kanzume Nippo, August 9, 1965.)

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### SKIPJACK TUNA LANDINGS DOWN FOR APRIL-JULY 1965:

Landings at the port of Yaizu, Shizuoka Prefecture, of pole-and-line caught skipjack tuna for April-July 1965 totaled 14,907 metric tons, or 9,754 tons below comparable 1964 landings. The Fisheries Agency's Tohoku Regional Fisheries Research Laboratory attributed the smaller landings to the scattering of fish as a result of low water temperatures and to greatly reduced effort. The reduced effort was attributed to the large numbers of skipjack vessels switching to and remaining in the albacore tuna fishery, which was excellent this year.

As a result of the smaller landings, packers reportedly were compelled to buy fish at the high ex-vessel price of 80 yen a kilogram (US\$202 a short ton). (Kanzume Nippo, August 20, 1965.)

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### ATLANTIC ALBACORE TUNA FISHING AND PRICE TRENDS:

The Japanese Atlantic albacore tuna fishery, which has been good this season, was reported rapidly falling off as of the latter part of July 1965. Catches off Angola, which earlier had averaged 4 tons per day per vessel declined to around 2.5 tons, and indications were the fishery might draw to a close earlier than anticipated.

The export price in July of frozen round albacore shipped to the United States was still holding at US\$290-295 a short ton f.o.b. transshipment port, but towards the end of July 600-700 metric tons of frozen albacore were sold to Spain at \$380-390 a metric ton c.i.f., corresponding to the f.o.b. (transshipment port) price of \$295-300 a short ton. (Suisan Tsushin, July 22, 1965.)

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Japan (Contd.):

# PLAN TO PROMOTE DOMESTIC ALBACORE TUNA DEMAND:

The Japan Federation of Tuna Fishermen's Cooperative Associations (NIKKATSUREN), at a directors' meeting held to develop measures to cope with the albacore price stabilization problem, voted to spend 100 million yen (US\$278,000) to promote albacore demand in Japan. To obtain funds for this promotion, which was launched September 1, 1965, NIKKATSUREN planned to assess tuna vessel owners 2 yen per kilogram (\$5 a short ton) of tuna landed directly in Japan or transshipped to Japan from the Atlantic Ocean. Assessment was expected to yield 170 million yen (\$472,000). (Shin Suisan Shimbun Sokuho, July 23, 1965.)

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# FISHERY RESEARCH VESSEL TO STUDY ATLANTIC TUNA RESOURCES IN FALL 1965:

The Japanese Fisheries Agency plans to dispatch the research vessel Shoyo Maru (604 gross tons) on a 170-day cruise to the Atlantic Ocean in fall 1965 to study tuna resources. The vessel, scheduled to depart Tokyo September 25 and return to Japan March 15, 1966, will call at such ports as Colombo, Ceylon; Capetown, South Africa; Rio de Janeiro, Brazil; Port of Spain, Trinidad; Balboa, Canal Zone; and Honolulu, Hawaii.

Research objectives are: (a) study distribution, abundance, catch by fishing ground and hook rate of important species; (b) collect samples of juvenile fish; (c) conduct oceanographic and meteorological studies; (d) tag and release fish; (e) study fishing conditions at ports of call; (f) transmit fishing condition reports daily to Misaki, Shimizu, and Yaizu radio stations during fishing operations. (Suisan Keizai Shimbun, July 24, 1965.)

Note: See Commercial Fisheries Review, Oct. 1964 p. 65.

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# EXPORTERS HANDLED 80,000 CASES OF CANNED TUNA FOR EXPORT TO U. S. IN JULY 1965:

The Standing Committee, Tuna Department, Japan Canned Foods Exporters Association, decided to handle for export to the United States in July 1965 a total of 70,000 cases of canned whitemeat tuna in brine (probably 7-oz. can size) with a promotional allowance of

US\$0.50 per case and 10,000 cases of the 4-lb. lightmeat in brine pack. Reportedly, the Canned Tuna Sales Company does not have any 7-oz. or 13-oz. lightmeat pack in stock. (Kanzume Nippo, July 28, 1965.)

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# CANNED TUNA EXPORT MARKET TRENDS:

The Japan Canned Tuna Packers Association was scheduled to hold a directors' meeting on August 27, 1965, to decide whether to have the Canned Tuna Sales Company not accept any consignments of canned tuna in brine (for export to the United States) for the third consignment period (January 1-March 31, 1966). The consignment quota for the third period totals 460,000 cases.

The August 27 meeting was called due to large stocks of canned tuna held on consignment by the Sales Company. It was reported that the Company had on hand about 1.6 million cases of tuna as of early August. Toward year's end the stock on hand was expected to decrease to about 1.5 million cases but increase to nearly 2 million cases in January-March 1966 should the Sales Company not impose any restrictions on consignments for that period. Under existing depressed market conditions for Japanese tuna, that quantity was considered excessive.

For the August 1965 sale of canned tuna in brine for export to the United States, the Sales Company agreed to offer for sale 50,000 cases (20,000 cases of whitemeat tuna and 30,000 cases of lightmeat tuna) and to make available another 40,000 cases of whitemeat tuna carried over from the July sale. It was reported that the Company, after examining the buy offers from the exporting firms, planned to increase the quantity to about 80,000 cases (Note: It is assumed that this quantity did not include the carryover of 40,000 cases). The 80,000 cases would consist of 50,000 cases of whitemeat tuna and about 30,000 cases of lightmeat tuna. It was also reported that a promotional allowance of US\$0.50 a case was being allowed for the whitemeat pack as in the July sale. (Suisan Tsushin, August 20 & 23, 1965.)

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# VIEWS ON POOR SALES OF CANNED TUNA IN U.S.:

Japanese tuna packers and exporters are said to be greatly concerned over the slow sales of canned tuna in brine for export to the United States, which in the current business year (December 1964-November 1965)

## Japan (Contd.):

is said to total only 1.24 million cases as of July 1965. In commenting on this situation, the chief of the Canned Tuna Department, Japan Canned Foods Exporters Association, recently expressed the following opinion:

1. The current stagnant sales of canned tuna in brine have reached a critical point never before faced by the tuna packing industry. To tide over this critical period and to save the industry from falling into ruin, packers must set aside their selfish interests and unite themselves from a broad viewpoint.

2. Japanese canned tuna prices are higher than those of U. S. products, especially those packed in Puerto Rico, by the amount of duty (12.5 percent) imposed on imports. Therefore, Japan must strive to reduce costs to close the price gap caused by this duty. However, mergers and other means of cost reduction cannot be accomplished overnight, so for the time being consideration should be given to the development of measures aimed at drastically reducing storage expenses and interest on loans, which presently amount close to US\$1 a case per year.

3. To tide over the present crisis, packers must adopt a more firm attitude, but exporters must also strive to improve their position. As regards the kind of policy the exporters should develop to cope with the present situation, I am now making a personal study of this matter but have not yet reached the point of seeking the advice of the proper agency. However, it seems to me that strict adherence to the policy of allocating quotas on the basis of past performance will not resolve this crisis. Therefore, I think it advisable that delay aside the quota system during the next six months or one year and develop a realistic sales policy. Of course, this does not mean we should eliminate the Exporters Agreement (concluded between packers and exporters and approved by the Government) or the system of allocating quotas on the basis of past performance record. I hope to thoroughly explore the Government's views on this problem and to study this matter in detail. (Suisan Tsushin, July 27, 1965.)

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#### TUNA INDUSTRY SUBMITS VIEWS ON WAYS OF STRENGTHENING INDUSTRY:

The third series of Japanese Government-industry meetings to seek ways and means of

stabilizing and strengthening the Japanese tuna industry was held at Tokyo on July 29, 1965. At that meeting, the vice-president of the National Federation of Tuna Fishermen's Cooperative Associations (NIKKATSUREN) submitted for consideration for the first time industry's proposal to stabilize the fishing industry. The proposal covered seven problem areas and three items for immediate consideration.

The seven problem areas were defined as: (1) The need for the Fisheries Agency to quickly obtain funds to cover expenses necessary to conduct studies in reducing manpower requirements on tuna fishing vessels. (2) As a means of attracting and securing crew members, the need to reduce the personal income tax of fishing vessel personnel. (3) Consideration of the problem involving employment of foreign labor. (4) Government regulations prescribing vessel crew complement be carefully studied in view of the need for substantial modifications. (5) The need to strengthen management base such as by permitting vessel owners to incorporate their enterprises. (6) The need to establish a unified export sales system to handle the packers' production as a means of strengthening the marketing structure. (7) The need to develop a basic policy governing exports of fishing vessels to South Korea in view of the impact such exports would have on the Japanese tuna industry.

The three items proposed for immediate consideration were: (1) Lowering interest rates on loans extended to medium and small fishery operators. (2) Relaxing fishing vessel loan requirements. (3) Creating an agency to handle financial adjustments for fishery operators terminating operations due to bankruptcy or business depression, and to facilitate fleet reduction through cancellation of vessel licenses issued to operators withdrawing from the fishery, thereby promoting consolidation of the tuna fishing industry. (Suisan Keizai Shimbun, July 30, 1965.)

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#### TUNA FISHERMEN'S FEDERATION STUDIES MEASURES TO OVERCOME DEPRESSED ECONOMIC CONDITION:

The Japanese Government and tuna industry have been holding a series of meetings to develop measures to stabilize and strengthen the industry. At the joint meeting July 29, 1965, a proposal was made by the vice president of the National Federation of Tuna Fish-

## Japan (Contd.):

ermen's Cooperative Associations (NIKKAT-SUREN) that in order to cope with the deteriorating economic condition and to strengthen the competitive international position of Japan's tuna fishery, immediate consideration be given to the establishment of a corporation to handle financial adjustments for tuna vessel owners withdrawing from the fishery due to bankruptcy or business depression and facilitate fleet reduction through cancellation of their vessel licenses. Details as to type, form, and function of the proposed organization were not disclosed, but on August 16 that organization was thoroughly studying problems involving implementation of the proposal.

At the August 5 meeting of NIKKATSUREN's policy committee it was proposed that this year (1965) some Atlantic-caught albacore tuna be diverted to the U. S. west coast to avoid oversupplying Puerto Rico, thereby depressing prices. This reportedly occurred in 1964 when over 30,000 tons of albacore were delivered to that Island. The policy committee feels that of the estimated annual total Atlantic Japanese albacore catch of 40,000 tons, 30,000 tons would be a reasonable quantity to ship to Puerto Rico and about 10,000 tons can be diverted to U. S. west coast packers. The additional freight cost of US\$10-20 a ton for shipping the tuna to the U.S. west coast would be borne by vessel owners, cold-storage operators, and exporters. Albacore tuna landings in excess of 40,000 tons would be shipped to Japan and packed in oil for sale on the Japanese domestic market. (Suisancho Nippo, August 18; Suisan Tsushin, August 19, 1965.)

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#### NEW ORGANIZATION TO REPRESENT COASTAL TUNA FISHERMEN:

Japanese tuna fishermen engaged in the tuna fishery off Japan, on July 27, 1965, organized a group called the "Near Seas (Off-shore) Tuna Fishermen's Council." In 1964 the Fisheries Agency had established the "Near Seas Tuna Fishery" as a licensed fishery (north of 10° N. latitude and west of 160° E. longitude), limiting the number of vessels that could engage in that fishery to 1,850 vessels ranging in size between 20-50 gross tons. The Council, under the sponsorship of the National Federation of Fishermen's Cooperative Associations, was organized to

represent fishermen engaged in that fishery. (Suisancho Nippo, July 28, 1965.)

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#### TUNA WAGE AGREEMENT SIGNED BY BOAT OWNERS AND CREW MEMBERS:

The Tunaboat Owners Association of Northern Miyagi, on August 11, 1965, met with representatives of crew members sailing on the Association's vessels and signed a wage agreement calling for the payment to crew members of fixed monthly wages. Formerly, crew members were paid on a share basis. Under the new wage contract, their income will now consist primarily of salary, plus other benefits, such as trip allowance and bonus to encourage production.

The wage agreement provides for the payment of the following monthly fixed wages: fishing captain 31,250 yen (US\$87); vessel captain 22,500 yen (\$63); chief engineer 26,250 yen (\$73); chief radio operator 22,500 yen (\$63); deck chief 19,500 yen (\$54); engine-room crew member 16,250 yen (\$45); and deckhand 15,000 yen (\$42). Including allowances and bonuses, a fishing captain is expected to receive per month a total sum of about 50,000 yen (\$139) and a deckhand about 23,000 yen (\$64). (Suisan Keizai Shimbun, August 20, 1965.).

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#### CANNING FIRM GRANTED PATENT FOR NEW TUNA PACK:

A Japanese canning firm in Urahara-machi, Shizuoka Prefecture, was granted a patent (No. 3812714) July 8, 1965, by the Japanese Government for a special canned tuna pack described as "tuna dressing pack." The firm originally filed a patent application October 14, 1960, but the issuance of patent rights was delayed due to objections filed by other firms that the process was already known to the industry. (Kanzume Nippo, August 7, 1965.)

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#### MARKET VALUE OF TUNA FISHING LICENSES:

Tuna fishing licenses in Japan, which are freely sold on the open market at a premium, are reported to have declined in value to 130,000-140,000 yen (US\$361-389) a vessel (gross) ton, compared with close to 400,000 yen (\$1,111) offered per ton 3 or 4 years ago. The decline in market value is attributed to

## Japan (Contd.):

depressed conditions in the tuna fishery caused by a decline in catch, longer trips, and growing labor costs. (Suisan Keizai Shimbun, July 21, 1965.)

Note: See Commercial Fisheries Review, Nov. 1964 p. 90, and Sept. 1964 p. 73.

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SALMON MOTHERSHIP FISHING IN NORTH PACIFIC AND BERING SEA ENDS:

The first (Kyokusan Maru, 10,757 gross tons) of the 11 Japanese salmon motherships operating in the North Pacific and Bering Sea reached its catch target on July 22, 1965. The remaining 10 motherships were expected to reach their targets by July 26 and to return to Hakodate, Japan, in early August. (Suisan Tsushin, July 24, 1965.)

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KING CRAB PRODUCTION IN BRISTOL BAY AS OF JULY 20, 1965:

The Japanese Canned Crab Sales Company reported that the Japanese pack of canned king crab in the Bristol Bay area through July 20, 1965, totaled 140,387 cases (48  $\frac{1}{2}$ -lb. cans). Of that total, 70,995 cases were packed by the factoryship Tainichi Maru and 69,392 cases by the Tokei Maru. The combined 1965 pack target of those vessels in Bristol Bay was previously reported as 185,000 cases of king crab. (United States Embassy, Tokyo, July 29, 1965, and other sources.)

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KING CRAB FACTORYSHIPS IN EASTERN BERING SEA TO REACH TARGET IN MID-AUGUST:

The two Japanese king crab factoryships (Tainichi Maru, 5,859 gross tons, and Tokei Maru, 5,385 gross tons) operating in the eastern Bering Sea, were expected to reach their combined production target of 185,000 cases (48  $\frac{1}{2}$ -lb. cans) in mid-August. As of July 21, their production totaled 141,741 cases, equal to 77 percent of the target. (Suisan Tsushin, July 24, 1965.)

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LIMITATIONS ON GULF OF ALASKA TRAWLING:

The Japanese Fisheries Agency licensed 11 trawl fleets to conduct commercial opera-

tions in the Gulf of Alaska in 1965 subject to the following limitations.

(1) Trawling for halibut, salmon, and king crab is prohibited. These species, if incidentally caught with other species of fish, shall be immediately returned to the sea.

(2) The catch of herring measuring less than 22 centimeters (8.7 inches) in body length (fork length) shall not exceed 10 percent of the total catch of herring. If that limit is exceeded, fishing operations shall be immediately suspended and shifted to other fishing grounds.

(3) No fishery, including the taking of sea animals and seaweed, shall be conducted in the sea area within 3 miles from the lowest tide mark of a foreign territory.

(4) Carrying long lines and gill nets aboard any trawler is prohibited.

(5) The daily catch of each trawling fleet shall be reported to the Japanese Government fishery inspector.

(6) In the following prescribed areas, between July 1 and October 31, fishing operations shall be avoided in the vicinity of United States crab pots or other fixed gear:

(a) The sea area bounded by a line starting from a point at 57°15' N. lat., 154°51' W. long., thence to a point at 56°57' N. lat., 154°34' W. long., thence to a point at 56°21' N. lat., 155°40' W. long., thence to a point at 56°26' N. lat., 155°55' W. long., and thence to the point of origin.

(b) The sea area bounded by a line starting from a point at 56°27' N. lat., 154°06' W. long., thence to a point at 55°46' N. lat., 155°27' W. long., thence to a point at 55°40' N. lat., 155°17' W. long., thence to a point at 55°48' N. lat., 155°00' W. long., thence to a point at 55°54' N. lat., 154°55' W. long., thence to a point at 56°03' N. lat., 154°36' W. long., thence to a point at 56°03' N. lat., 153°45' W. long., thence to a point at 56°30' N. lat., 153°45' W. long., thence to a point at 56°30' N. lat., 153°49' W. long., and thence to the point of origin.

(c) The sea area bounded by a line starting from a point at 56°30' N. lat., 153°49' W. long., thence to a point at 56°30' N. lat., 153°00' W. long., thence to a point at 56°44' N. lat., 153°00' W. long., thence to a point at 56°57' N. lat., 153°15' W. long., thence to a point at 56°45' N. lat., 153°45' W. long., and thence to the point of origin.

(d) The sea area bounded by a line starting from a point at 57°05' N. lat., 152°52' W. long., thence to a point at 56°54' N. lat., 152°52' W. long., thence to a point at 56°46' N. lat., 152°37' W. long., thence to a point at 56°46' N. lat., 152°20' W. long., thence to a point at 57°19' N. lat., 152°20' W. long., and thence to the point of origin.

(e) The sea area bounded by a line starting from a point at 57°35' N. lat., 152°03' W. long., thence to a point at 57°11' N. lat., 151°14' W. long., thence to a point at 57°19' N. lat., 150°57' W. long., thence to a point at 57°48' N. lat., 152°00' W. long., and thence to the point of origin.

(f) The sea area bounded by a line starting from a point at 58°00' N. lat., 152°00' W. long., thence to a

## Japan (Contd.):

point at 58°00' N. lat., 150°00' W. long., thence to a point at 58°12' N. lat., 150°00' W. long., thence to a point at 58°19' N. lat., 151°29' W. long., and thence to the point of origin. (Fisheries Attache, United States Embassy, Tokyo, July 21, 1965.)

Note: See Commercial Fisheries Review, Aug. 1965 p. 79; Feb. 1965 p. 51; Jan. 1965 p. 26.

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# FIRMS TO BUY ALASKA POLLOCK FROM U.S.S.R.:

Several major Japanese fishing companies are developing plans (strongly opposed by the coastal fishermen and processors of Hokkaido) to send their factoryships to the Okhotsk Sea in winter 1965/66 to buy Alaska pollock from Soviet trawlers, primarily for processing into fish meal. They are reported to have submitted to the Fisheries Agency applications to purchase from the Soviet Union a total of 180,000 metric tons of fresh Alaska pollock.

In January-March 1965, a Japanese firm engaged in the first venture of this type with the Soviet Union. In that operation, that firm's 14,000-ton factoryship Hoyo Maru processed into fish meal 36,300 metric tons of fish delivered by Soviet trawlers. (Suisan Tsushin, July 24; Suisancho Nippo, July 26, 1965.)

Note: See Commercial Fisheries Review, July 1965 p. 82, May 1965 p. 76; March 1965 p. 83.

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# CANNED SHRIMP SUPPLIES FOR EXPORT AT RECORD LOW:

There were no Japanese exports of canned shrimp in May-June 1965 due to the extremely light supplies available from the 1965 pack, and also because the 1964 pack has been completely sold out. In April 1965, canned shrimp exports totaled only 621 cases (24 ½-lb. cans), having dropped from 11,032 cases in March.

In May-June 1964, Japan exported 141,616 cases of canned shrimp. Of that total, 30,053 cases went to the United States, 98,024 cases to the United Kingdom, 11,020 cases to Canada, and the remainder to other countries. (Fisheries Attache, United States Embassy, Tokyo, August 4, 1965.)

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# SWORDFISH EXPORT APPROVALS TO THE U. S. AND CANADA, APRIL-MAY 1965:

Japanese export approvals of frozen broadbill swordfish to the United States and Canada

in April-May 1965 totaled 563.6 short tons valued at US\$372,149, as compared to 365.0 tons valued at \$192,950 in April-May 1964.

The frozen swordfish export validations in April-May 1965 included 385.3 tons of fillets valued at \$244,993; 60.3 tons of chunks valued at \$48,629; and 118.0 tons of other swordfish valued at \$78,527. In April-May 1964, frozen swordfish export validations included 280.7 tons of fillets valued at \$139,161; 71.3 tons of chunks valued at \$47,079; and 13.0 tons of other swordfish valued at \$6,710. (Fisheries Attache, United States Embassy, Tokyo, August 12, 1965.)

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# CANNED SAURY EXPORTS FOR 1965:

Data from the Japan Saury Sales Company reveal that canned saury consigned for export during the business year 1965 (beginning August 1964) totaled 506,000 cases and stocks were completely sold by June 30, 1965. Compared to the previous business year, exports were down by about 450,000 cases. The sharp decline in exports was due to greatly reduced stocks resulting from the extremely poor saury season, which begins in the fall. The 1964 catch of saury totaled about 200,000 metric tons, down 46 percent from the 380,000 tons in 1963.

Principal countries that bought canned saury in business year 1965 were: New Guinea 206,020 cases; Ceylon 158,000 cases; Burma 42,300 cases; Malaysia 34,165 cases; and the Philippine Republic 13,813 cases. In business year 1964, the Philippine Republic (416,985 cases) and New Guinea (221,665 cases) were the largest importers of canned saury. (Kanzume Nippo, July 21, 1965, and other sources.)

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# NORTH PACIFIC AND BERING SEA WHALING TRENDS, 1965:

Japan's catch of whales through July 3, 1965, by three whaling fleets operating in the North Pacific and Bering Sea totaled 484.99 blue-whale units of baleen whales and 959 sperm whales. That catch yielded 6,430 metric tons of baleen oil and 7,131 tons of sperm oil. During the same period in 1964, the three fleets caught 540.66 blue-whale units of baleen whales and 605 sperm whales for a production of 7,526 tons of baleen oil and 4,678 tons of sperm oil.

## Japan (Contd.):



Fig. 1 - Stern view of Japanese whale factoryship with stern ramp for retrieving dead whales for processing.

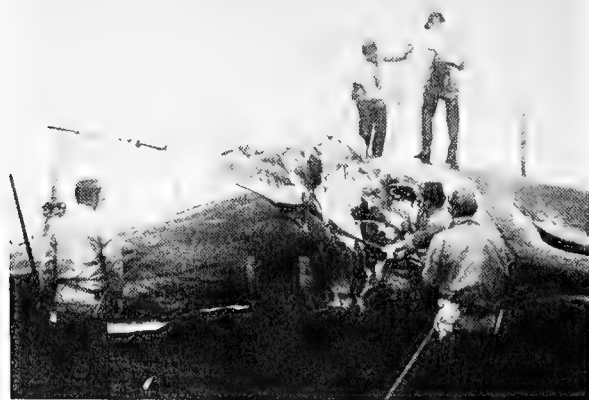


Fig. 2 - Flensing sperm whale aboard a Japanese factoryship in the North Pacific.

In 1964 all three fleets concentrated on catching both baleen and sperm whales. But in 1965 only one fleet concentrated on both species of whales. Efforts of the other two fleets were divided between baleen and sperm whales, one for baleen whales only and the other fleet hunted sperm whales. The pattern of fishing effort in 1965 as compared with 1964 may account for the difference in catch by species between the two years. (Fisheries Attache, United States Embassy, Tokyo, August 3, 1965.)

Note: See Commercial Fisheries Review, Aug. 1965 p. 86; July 1965 p. 78; May 1965 p. 80.

\* \* \* \* \*

#### WHALE CATCH FROM COASTAL AREAS, 1965:

Japanese coastal whalers during the season through July 7 landed 343 sei whales, 3 humpback, and 129 sperm whales as compared with a catch of 4 blue whales, 10 finback, 500 sei and 177 sperm whales during about the

same period in 1964. (Fisheries Attache, United States Embassy, Tokyo, August 3, 1965.)

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#### WHALING IN NORTH PACIFIC-BERING SEA:

The three Japanese whaling fleets operating in the North Pacific and Bering Sea had harvested, as of July 25, 1965, a total of 3,657 whales, consisting of 1,517 sperm whales, 1,143 sei whales, 917 fin whales, 41 blue whales, and 39 humpback whales. (Suisan Tsushin, July 27, 1965.)

Note: See Commercial Fisheries Review, July 1965 p. 78, and Aug. 1965 p. 86.

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#### BERING SEA FISHING TRENDS AND WHALING:

As of August 18, 1965, the fish meal factoryship Hoyo Maru (14,094 gross tons) operating in the eastern Bering Sea caught 72,000 metric tons of fish and produced 11,200 tons of fish meal, 2,450 tons of fish solubles, 1,100 tons of fish oil, and 3,900 tons of frozen products.

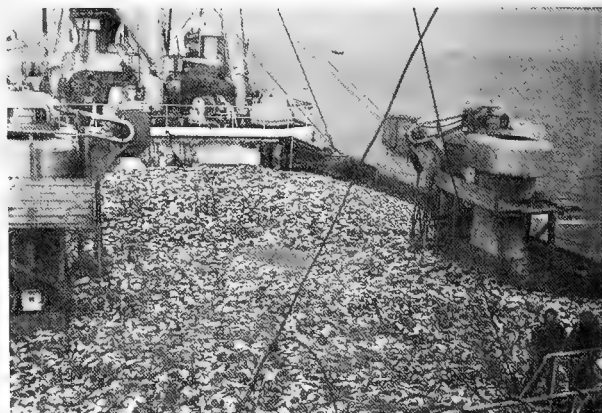


Fig. 1 - Fish on afterdeck of Japanese factoryship Gyokuei Maru.

The fish meal factoryship Gyokuei Maru (10,357 gross tons), also in the eastern Bering Sea, as of August 17 caught 83,500 metric tons of fish and produced 13,000 tons of fish meal, 2,750 tons of fish solubles, 1,050 tons of oil, and 3,250 tons of frozen products.

The Hoyo Maru and Gyokuei Maru were scheduled to terminate operations around September 20 and were expected to exceed their targets, (Suisan Tsushin, August 20, 1965.)



## Japan (Contd.):



Fig. 2 - Japanese factoryship Tenyo Maru with fishing trawler alongside.

A large Japanese fishing company has been studying plans to dispatch the 11,500-ton factoryship Tenyo Maru to the Bering Sea for the 1965/1966 winter season, but the firm encountered some difficulty in signing up trawlers in the 200- to 300-ton class to fish for the factoryship. (Shin Suisan Shimbun Sokuho, August 20, 1965.)



Fig. 3 - Japanese factoryship Chichibu Maru.

The Japanese factoryship Chichibu Maru (7,422 gross tons) was scheduled to depart Hakodate, Japan, for the Bering Sea around August 30. Accompanied by 8 trawlers in the 260-ton class, she was scheduled to remain on the fishing grounds for about 44 days. (Suisan Tsushin, August 19, 1965.)

The 7,000-ton refrigerated carrier vessel Kashima Maru departed Kobe, Japan, for the whaling base at South Georgia Island on August 18, 1965. Ten whale catcher vessels and the 13,000-ton tanker Matsushima Maru



Fig. 4 - Japanese freezer-factoryship at a harbor in South Georgia Island.

were to join the Kashima Maru at the South Georgia base in the Antarctic. Production target of the fleet is 170 blue-whale units, plus 40 sperm whales. (Minato Shimbun, August 19, 1965.)

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#### JOINT JAPANESE-NORWEGIAN WHALING VENTURE:

The Japanese Fishery Agency has accepted and is expected to approve a contract between a large Japanese fishing company and a Norwegian whaling firm, according to the periodical Nihon Keizai Shimbun, August 17, 1965. The contract provides that five catcher vessels owned by the Japanese firm are to be sold to the Norwegians and that Japanese crews will operate the vessels. The Japanese firm will purchase 7,000 metric tons of whale meat from the Norwegians.

The periodical pointed out that the contract did not appear to be a lucrative one for the Japanese, but it would allow the Japanese firm to satisfy its whale meat requirements while eliminating surplus vessels and providing continuous employment for catcher vessel crews (Fisheries Attache, United States Embassy Tokyo, August 19, 1965.)

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#### FISH OIL PRODUCTION, 1960-1964:

Japanese production of fish-body oil in 1964 totaled 18,300 metric tons according to data from the Japan Aquatic Oil Association. (Editor's Note: That total is larger than previous reports indicated because the earlier data did not include oil from North Pacific and Bering Sea operations.) The 1964 production of fish-body oil was down 12 percent from 1963 due mainly to a sharp drop in production of saury oil.

Japanese production of fish-liver oil in 1964 totaled 8,700 tons. That was a gain of

## Japan (Contd.):

Japan's Production of Fish-Body Oil, Liver Oil, and Squid Oil, 1960-1964					
Type of Oil	1964	1963	1962	1961	1960
	. . . . (1,000 Metric Tons) . . . .				
<b>Fish-Body Oil:</b>					
Saury . . . . .	2.8	7.7	18.9	11.0	7.0
Mackerel . . . . .	0.8	2.0	3.2	0.4	0.6
Atka mackerel . . . . .	1.8	0.9	0.7	2.4	0.6
Sand lance . . . . .	0.1	0.4	0.7	1.1	1.0
Sardine . . . . .	0.3	0.6	0.8	0.9	0.6
Flatfish <sup>1/</sup> . . . . .	7.4	5.9	8.8	8.0	5.3
Other fish-body oils . . . . .	5.1	3.4	4.2	6.1	5.0
Total fish-body oil . . . . .	18.3	20.9	37.3	29.9	20.1
<b>Fish-Liver-Oil:</b>					
Alaska Pollock . . . . .	7.5	6.0	7.8	6.7	6.2
Shark . . . . .	1.0	1.3	2.2	2.2	3.8
Other fish-liver oils . . . . .	0.2	0.2	0.7	1.7	1.1
Total fish-liver oils . . . . .	8.7	7.5	10.7	10.6	11.1
Squid Oil . . . . .	1.0	2.7	3.2	3.0	2.7
Grand Total . . . . .	28.0	31.1	51.2	43.5	33.9
<sup>1/</sup> Includes oil from North Pacific and Bering Sea operations.					

15 percent over the previous year due to greater production from Alaska pollock. Japanese output of shark-liver oil continued to decline in 1964. Squid oil production was also down. (Fisheries Attache, United States Embassy, Tokyo, August 24, 1965.)

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#### MORE LARGE TRAWLERS TO BE LICENSED TO FISH IN ATLANTIC AND SOUTH PACIFIC:

In July 1963 the Japanese Government approved the licensing of a total of 48 standard (50- to 300-ton class) vessels (in addition to the 30-odd large stern trawlers already in operation) to engage in the Atlantic Ocean and South Pacific distant-water trawl fishery. It was decided at that time that after a sufficient interval had elapsed the licensing of additional trawlers would be considered. On July 26 the Central Fisheries Coordination Council (highest Government-industry advisory group) for the second time in two months reviewed and adopted the Fisheries Agency's recommendations to license additional vessels for the distant-water trawl fishery. The Agency's recommendation was based on the conclusion that the exploitation of unutilized bottomfish resources is essential in assisting the depressed offshore trawl, purse-seine, and tuna long-line fisheries, particularly in view of the spectacular advances being made in the trawl fisheries of other foreign nations.

The Agency recommended that: (1) 22 additional vessels over 500 gross tons in capacity be licensed to engage in the distant-water trawl fishery; (2) operational areas be extended be-

yond the existing areas designated for the distant-water trawl fishery; and (3) licenses to engage in distant-water trawling also be granted to operators of purse-seine vessels and tuna long-liners, including portable-boat-carrying motherships that wish to switch to trawling. Previously, licenses were issued only to owners of vessels engaged in other trawl fisheries:

Concerning proposal (1), the Agency recommended that in licensing the 22 vessels consideration should be given to the condition of fishery resources in the area of operation, as well as conditions of the fishery from which the vessel owner desires to withdraw and adjustments that will be required to make the change. Sizes of vessels to be newly licensed will be grouped into three tonnage categories, i.e., over 500 but under 550 tons, over 550 but under 1,000 tons, and over 1,000 tons.

Proposal (2) called for expanding the operational area of the distant-water trawl fishery to include all ocean areas except the waters north of 10° N. latitude in the Pacific Ocean, the waters north of 40° N. latitude in the Atlantic Ocean, the Mediterranean Sea east of 5°30' E. longitude, the Gulf of Aden west of 50° E. longitude, and the Red Sea. Thus, under this change, the trawl fisheries in the Indian Ocean, Atlantic Ocean south of 40° N. latitude, and Pacific Ocean south of 10° N. latitude will henceforth be regulated as one fishery.

Under proposal (3), in case the number of license applications exceeds the officially announced 22 vessels, priority in granting licenses will be as follows, based on provisions to be separately prescribed: (1) preference be given on basis of vessel tonnage withdrawn from the offshore trawl fishery, Isei (East China Sea) trawl fishery, large- and medium-size purse-seine fishery, and distant-water tuna fishery, including portable-boat-carrying mothership-type fishery; and (2) in the case of newly built vessels, priority will be given only to vessels with crew quarters built in conformity to the standard prescribed for distant-water trawlers. Licensing of existing vessels will be based on the condition that in case of their replacement by new vessels, the replacement vessels will contain crew quarters built to prescribed specifications. Applicants who already own several distant-water trawlers (over 10 percent of total licensed vessel tonnage) will be placed below others on the priority list. Also, operators of large and medium purse seiners in the western Japan Sea area who withdraw vessels

## Japan (Contd.):

over 100 gross tons in capacity will be given preferential treatment.

In connection with the new licensing policy on distant-water trawling, the Fisheries Agency has clarified its views on the condition of the bottomfish resources off the African coast in the Atlantic Ocean, as follows:

At the present time, the operation of Japanese trawlers in the Atlantic Ocean off Africa is confined to certain areas somewhat different from those fished by trawlers of other foreign countries, and there still remain considerable areas that can be exploited. In the future as the fishing grounds are expanded, the composition of the catch will change and this will require planning for the development of new markets.

The grounds off northwest Africa are the main fishing grounds for sea bream, squid, and octopus, which are now being transshipped to Japan. The fishery is profitable but prospects do not appear bright for developing a fishery for those species in other areas. On the other hand, the catch of other species, such as mackerel, is increasing. They were formerly discarded but they have come to have commercial value through improvements made in processing techniques and through the development of new markets, and hope is held for the future development of a fishery for those species.

The southern fishing grounds are highly productive and the topography of the sea bottom is such that the resources are well protected from fishing pressure. Thus, it is believed that fishing effort can be substantially increased without endangering the resources. It is not possible to speculate on the present or future condition of the resources due to the short history of the fishery and to the inadequacy of data but it is believed that on the whole there is further room for exploitation.

In some cases, catch per unit of effort for certain species has decreased slightly and the size of the fish in the catch has become smaller. These are considered characteristic features of a virgin resource under exploitation. After a while the catch will tend to stabilize at a lower level. However, it is necessary to continue to observe these developments by carefully studying them in the future. (Suisan

Keizai Shimbun, July 27 & 29; Suisancho Nippo, July 27, 1965, and other sources.)

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## NEW STERN TRAWLER DELIVERED:

A Japanese fishing company on July 22, 1965, took delivery of the new stern trawler Tokachi Maru (2,530 gross tons). The trawler was scheduled to depart Japan August 2 for the Gulf of Alaska under charter to another Japanese fishing company. (Suisan Tsushin, July 23, 1965.)

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## RESTRICTIONS LIFTED ON FISHING VESSEL EXPORTS TO SOUTH KOREA:

The Japanese Government was scheduled on July 30, 1965, to formally eliminate the restrictions placed on Japanese fishing vessel exports to the Republic of South Korea. The restrictions, which were imposed in 1953 as a retaliatory measure against South Korea following the establishment of the Rhee Line, prohibited the exportation to that country of Japanese fishing vessels other than wooden vessels over 5 years old. One exception to this decree was made in early 1965 when the export of 11 new 145-ton tuna fishing vessels (exported as "refrigerated vessels") was permitted to expedite the negotiations between Japan and South Korea to normalize relations. During the negotiations the Japanese Government had agreed to favorably reconsider its 1953 decision should the talks (agreement concluded June 1965) be satisfactorily concluded. (Suisan Keizai Shimbun, July 30, 1965.)

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## GOVERNMENT ADOPTS EXPORT TARGET AND PROMOTION MEASURES:

The Supreme Export Council of Japan met on August 16, 1965, to discuss export targets for fiscal year 1965 (April 1965-March 1966) and measures to promote their attainment. The Council officially adopted the 1965 export target of US\$8,530 million (actual FY 1964 exports were \$7,187 million), based on export validations. The export target for agricultural and fishery products was set at \$514.7 million, or about 6 percent of the national export target. Included is \$168.9 million for canned food products (including canned fish), \$172.8 million for fishery products (other than canned), and \$22.8 million for oils and fats. Actual exports in 1964 for canned food products

## Japan (Contd.):

totalled \$167.3 million, fishery products \$153.5 million, and oils and fats \$28.7 million.

To promote exports of marine products, the Council adopted resolutions to: (1) give special consideration to financial transactions entered into by the Sales Companies (e.g., better terms for letters of credit issued by the Companies); (2) relax terms of payment for the construction of fishing vessels for the domestic fishery (e.g., extending same loan terms as those granted for the construction of fishing vessels for export to foreign countries); (3) broaden the special tax measures implemented in fiscal year 1964 to promote exports but which have been found not fully effective, strengthen the base of enterprises engaged in export, and study and implement a tax system aimed at encouraging export trade; and (4) give special consideration to the treatment of incomes derived from export transactions involving frozen fishery products and fresh tuna, which can be considered as falling within the classification of primary products, and that such incomes be treated under the special tax measures. (Suisan Keizai Shimbun, August 17, 1965.)

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#### COMMITTEE OF SPECIALISTS' VIEWS ON PROMOTING FISHERIES:

The Japan Fisheries Society, as its primary activity for business year 1965, established a committee of specialists to study ways and means of promoting Japan's international fisheries. The committee holds the view that: (1) measures to stabilize management and to increase productivity should be developed based on the concept of international cooperation so as to improve Japan's competitive position in international fisheries, and (2) the Government should extend favorable treatment to fishery operators with regard to loans and taxes. The committee, which plans to review and seek modification, if necessary, of the existing licensing system so as to permit depressed fishery operators to combine their enterprises into corporations of appropriate sizes as a means of stabilizing management, is expected to have its study completed shortly and to request the Government to establish a government-industry study group to develop plans to implement its proposals. (Suisan Keizai Shimbun, August 14, 1965.)

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#### RESEARCH VESSEL TO EXPLORE WATERS SOUTH OF AUSTRALIA:

The Japanese Fisheries Agency planned to dispatch September 1, 1965, the research vessel Suruga Maru No. 1 (339 gross tons) to the Continental Shelf waters south of Australia. The vessel is scheduled to operate about 73 days principally along the Shelf about 600 miles from shore to develop new fishing grounds. (Suisan Keizai Shimbun, August 24, 1965.)

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#### FUNDS FOR FISHERY DATA CENTER WILL NOT BE AVAILABLE BEFORE 1967:

In hopes of establishing a centralized fisheries data center for the collection, dissemination, and analysis of data to promote the rational development and use of fishery resources, the Fisheries Agency of Japan organized a committee composed of scientists from the Agency's 8 regional laboratories to formulate concrete plans on staffing, facility, and budget requirements.

The Agency had hoped to have funds allotted for the center in fiscal year 1966 (April 1966-March 1967), but in view of the Government's policy of holding manpower ceilings at the existing level the Agency felt that the program submitted by the scientific committee, which provided for a total of 31 new positions, would not be acceptable to the Government. The Agency then had its Research Division draft a modified scaled-down program, which was submitted to the scientific committee for study. The committee is said to have found the substitute plan inadequate and to have rejected it. It now appears that it will not be possible to secure funds for the center until fiscal year 1967. (Suisan Keizai Shimbun, July 26, 1965.)

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#### FISHING COMPANY RANKS 102 IN SALES IN THE WORLD:

According to the August 1965 issue of Fortune magazine, the Taiyo Fishing Company of Japan ranks 102 in sales among the world's largest business enterprises (not including United States firms) and within Japan ranks number 15 in this category. In 1964 Taiyo's sales totaled 99.9 billion yen (US\$277 million) and the sales of the 37 subsidiary companies in which that firm owns over 50 percent of the stock totaled 85.9 billion yen (\$239 million). (Suisan Tsushin, July 30, 1965.)



## Republic of Korea

### FROZEN TUNA EXPORT TARGET FOR 1965:

The South Korean Government has revised downward its tuna export target for 1965. The original target of US\$3.7 million was lowered to \$2 million inasmuch as exports up to May only totaled \$560,000. (Suisan Keizai Shim-bun, July 29, 1965.)

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### NEW TUNA VESSEL FOR TRAINING CENTER:

In August 1965, a new 142-foot fisheries training vessel named the Chin Dal Le was delivered by its Japanese builders at Shimizu to the Deep Sea Fishing Training Center at Pusan, Korea. The Training Center, which was opened in early 1965, is a joint project of the Korean Government and the United Nations Special Fund. Its purpose is to produce qualified fishermen and technicians for South Korea's expanding offshore fisheries. The project is to run 5 years with the Food and Agriculture Organization (FAO) as the executing agency.

The 300-ton Chin Dal Le will be used to train Korean fishermen in tuna long-line fishing methods. The vessel has an 800-horsepower main engine and is designed to carry 40 trainees plus a 16-man crew. It has a hold capacity for 90 to 100 metric tons of tuna, which it can freeze at a rate of 3 tons a day.

The skipper of the Chin Dal Le will be a Korean national and the chief instructor will be an FAO master fisherman from Japan. The vessel will operate around the Samoan Islands during training cruises of 3 to 4 months.

A second training vessel, a 150-ton stern trawler, for the Pusan Training Center is being built in Niigata, Japan, and is scheduled for delivery in December 1965. (Food and Agriculture Organization, Rome, August 10, 1965.)

Note: See Commercial Fisheries Review, Feb. 1965 p. 73.



## Netherlands

### NEW TYPE NET DESIGNED FOR SHRIMP TRAWLING:

A Dutch fisherman in the Province of North Holland, Netherlands, has designed a new type net for shrimp trawling. During extensive testing, this type wing trawl showed much better results than a conventional net trawled from the same vessel.

The designer refused to have the net patented by commercial net manufacturers because he wants "all fishermen to benefit." He has asked the Netherlands Fisheries Research Institute to patent the net and to make the design available to all net manufacturers.

The principle of the new net is based on the shrimp's habit of rising or jumping from the seabed when disturbed. It has two bags, the upper one (garnalenaatje) with a mesh size suitable for shrimp and the lower one (visaasje) with wider mesh. Undisturbed entry is allowed into the lower bag while the upper one has a flapper (garnalentrechter) across its mouth.

During trawling the leads disturb the shrimp; they rise from the seabed through the mesh across the mouth of the upper bag and thus into the bag. Nearly all flatfish, sea plants, and other unwanted matter are swept along the underside of the flapper and out through the end of the lower bag. The tests have shown that practically no shrimp escape through the lower bag.

Undersized shrimp that enter the upper bag pass through the mesh of the bag undisturbed. In a conventional net without the flapper, the mesh of the bag is often clogged by fish, plants, and other matter, causing a considerable loss of undersized shrimp and fish. The mesh of the flapper is so small that few undersized flatfish can enter the upper bag. If large quantities of flatfish are available, the mouth of the lower bag can be closed. By doing this, two practically completely separated catches of shrimp and fish can be made in the same trawl at the same time.

A considerable amount of undersized flatfish can be saved yearly if this type trawl is in general use. According to conservative estimates of the Institute Scientist, Dutch shrimp fishermen seriously injured about 1,000 million undersized plaice caught in

## Netherlands (Contd.):

their nets in 1964. About 155 million sole hatched in 1963 were destroyed by shrimp fishermen in the North Sea from August 1 to December 1 of that year. At the same time great numbers of undersized shrimp that could not get through the clogged mesh of the older nets will be saved. This improves the chances of better catches at later dates.

A considerable amount of labor will also be saved by the new net. Most of the Dutch shrimp vessels carry a crew of only two. With the trawls now in use they spend hours sorting the shrimp from the huge quantities of unwanted matter scooped into the nets.

With the new shrimp trawl, fishing could also become more economical. Because of mesh clogging, the vessels have been unable to trawl against the current. More than 28 percent less undersized shrimp used as chicken feed was caught in the new net than in the older one during the tests. At the same time up to 25 percent more shrimp for human consumption were caught in the new net during simultaneous trawls from the same vessel. (The South African Shipping News and Fishing Industry Review, March 1965.)



## New Zealand

TUNA EXPLORATIONS ON  
EAST COAST SHOW PROMISE:

In early April 1965, about a ton of tuna (albacore and skipjack) was caught in one gill-net haul by the exploratory vessel Akina, which was under charter to the New Zealand Marine Department. A Marine Department scientist aboard the Akina while it was investigating the tuna potential in the Gisborne area said there was plenty of tuna off the New Zealand east coast. He said that tuna fishing with gill nets and trolling lines off Gisborne should be successful, but that a great deal of time and effort could be saved if initial studies on salinity and temperature were made before commercial fishing began.

Schools of tuna were also located in the Cape Runaway area by the exploratory vessel Sea Star before the vessel was accidentally beached. (New Zealand Commercial Fishing, May 1965.)

Note: See Commercial Fisheries Review, June 1965 p. 66.

## Norway

## COD FISHERY AS OF JUNE 19, 1965:

At the close of the Finmark cod season on June 19, Norwegian young and spawning cod landings in 1965 totaled 83,411 metric tons, of which 30,947 tons were sold for filleting, 29,557 tons for drying, 13,265 tons for salting, and 9,642 tons for marketing as iced fish.

The cod catch in the same period of 1964 totaled about 66,647 tons, of which 14,920 tons were sold for filleting, 26,957 tons for drying, 18,019 tons for salting, and 6,751 tons for marketing as iced fish.

In early June 1965, the Finmark fishery for young cod off northern Norway was still yielding good results. Norway's Lofoten fishery for spawning cod ended earlier with a disappointing catch of only about 19,500 tons, or a decline of 4,100 tons from the 23,600 tons taken off Lofoten during the 1964 season. (Fiskets Gang, No. 24, June 17, and No. 25, June 24, 1965.)

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## NORTH SEA HERRING

## FISHERY TRENDS AS OF JULY 1965:

Norway produced 200,000 metric tons of herring meal and almost 100,000 tons of herring oil from its North Sea herring fishery in the first 6 months of 1965. Herring fishing was still very good at mid-year. In June 1965 Norwegian fishermen caught more than 93,000 tons of herring in the North Sea and in July the catch totaled 149,000 tons. In addition, the herring catch off the coast of North Norway amounted to about 56,000 tons.

All Norwegian reduction plants were working at top capacity into August and fish meal and oil demand on the world market was reported difficult to meet. Contracts are being signed for deliveries far into 1966.

Note: See Commercial Fisheries Review, Sept. 1965 p. 73.

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## HERRING OIL PRODUCTION

## MAY REACH 100,000 TONS IN 1965:

Record catches of herring in the North Sea have resulted in a production of about 75,000 metric tons of herring oil in Norway during January-July 1965, or about 30,000 tons more than during the same period of 1964. Production during the remainder of the year may bring total 1965 production close to the 1956 record of 103,000 tons. Virtually all of the



## Norway (Contd.):

Norwegian herring oil is used in the domestic fat-hardening industry. (United States Embassy, Oslo, August 16, 1965.)

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#### WHALING RECOMMENDATIONS FOR 1965/66 ANTARCTIC SEASON:

A conference of active whaling nations (Japan, Norway, and the U.S.S.R.) was scheduled to convene in Tokyo, September 1, 1965. During preparations for the meeting, a Norwegian delegate said that Norway would support division of the 1965/66 Antarctic quota of 4,500 blue-whale units on the same basis as last season. That would give Japan 52 percent, Norway 28 percent, and the Soviet Union 20 percent of the quota. Newspapers in Oslo reported that the Norwegian delegation to Tokyo would again argue for implementation of the International Observers Scheme.

Preparations for the Tokyo meeting come at a time when international organizations were being urged to bring about a drastic reduction in the whale catch in order to avoid annihilation of world stocks. On August 20, 1965, at a meeting in Geilo of the Norwegian Oceanographic Research Society, one of Norway's leading marine biologists argued that no blue whales should be killed until the present stock has replenished itself. He said that only 4,000 fin whales and 3,000 sei whales should be taken annually. If the whaling nations are not able to agree to such a reduction, he said the Food and Agriculture Organization should intervene. (United States Embassy, Oslo, August 26, 1965.)

Only 2 Norwegian pelagic whaling expeditions are to participate in the 1965/66 Antarctic season as compared with 4 expeditions in the 1964/65 season, according to an earlier Oslo press report. The Norwegian factoryships are the Thorshavet and the Kosmos IV. The reduction in the number of whaling expeditions affects about 800 persons who will have to find other employment.

Norway's Journal of Commerce and Shipping reported on July 19, 1965, that not more than 5 Japanese expeditions will participate in the 1965/66 Antarctic whaling season as compared with 7 the previous season. Also, it was believed that the Soviets would probably not send out all 4 of their factoryships. (United States Embassy, Oslo, August 1, 1965.)



## Pakistan

### SHRIMP INDUSTRY POTENTIAL:

Pakistan needs approximately 48 additional trawlers to increase its shrimp production from 3,400 metric tons to 4,590 tons, the target called for in Pakistan's Third Five-Year Plan. The Third Plan, which began July 1, 1965, calls for a 30-percent increase in fish and shrimp production. Demand for shrimp and fish in West Pakistan is primarily for export.

The investment Advisory Center of Pakistan has prepared a study showing several business opportunities based on the West Pakistan shrimp industry. The study covers in detail the cost and operation of shrimp trawlers and indicates a wide variety of supporting opportunities including radio communications, use of spotter planes, and moth-erships. (International Commerce, August 23, 1965, U. S. Department of Commerce.)

Note: Additional information and a copy of the report titled "Facts and Possible Opportunities in the West Pakistan Shrimp Industry" can be obtained from: Investment Advisory Center of Pakistan, Farid Chambers, Victory Rd., Karachi, Pakistan.



## Panama

### FISHERY TRENDS, 1964 AND EARLY 1965:

Fish Reduction Industry: The only significant new development in Panama's fisheries during 1964 and early 1965 has been in the fish-reduction (fish meal) industry. Although only one fish meal plant was in operation in Panama as of early summer 1965, a second plant was under construction and there is interest by the Government and private industry to further develop this industry. Most informed sources agree, however, that the expansion of a fish meal industry in Panama will be severely limited by the availability of suitable fish (anchoveta and thread herring), and that the licensing of new plants must be carefully regulated to prevent overfishing. In



Fig. 1 - Fish meal plant at Puerto Caimito near La Chorrera.

## Panama (Contd.):

any case, it is expected that Panama's fish meal industry will grow at a much slower pace than it has on the rest of the west coast of South America and that additional investment will depend on the success of its two plants.

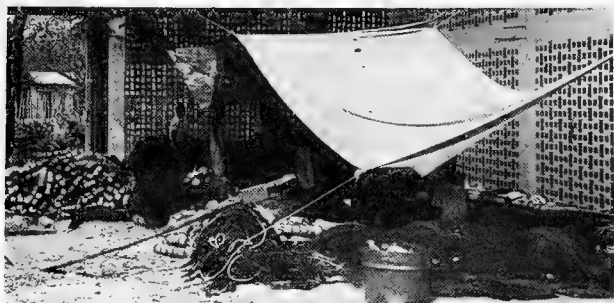


Fig. 2 - Repairing purse seine at Puerto Caimito fish meal plant.

The plant already in operation is located at Puerto Caimito, 18 miles west of Panama City. It was established in late 1963 to take over the assets and liabilities of the then operating plant. Ownership is equally divided between local and United States interests and the plant is operated by a local management consulting firm. The present facility is able to process 10 to 12 tons of fish an hour. However, equipment is on hand to install a new line to double present processing capacity, bringing ultimate capacity to about 20 tons an hour. While some of the equipment is antiquated, the plant is being refurbished and new equipment is being installed, including a stick-water plant. The total investment is estimated at US\$600,000, including \$100,000 invested during the past year (1964). The plant's operation is handicapped by a lack of deep-water docking facilities, but a pier permitting the landing of approximately 6 tons of raw fish

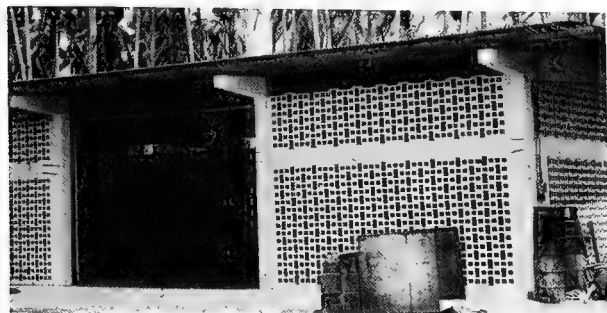


Fig. 3 - Prior to shipment, bagged fish meal is stored in this ventilated building of Puerto Caimito fish meal plant.

an hour does permit landing during most of the day. A new suction pump and line will considerably increase present capacity.

No official statistics are available on Panama's fish meal exports in 1964, but the only company presently exporting advises they have contracts in West Germany for 250 tons a month and in the United States for 200 tons a month. In addition, some sales are made to other Central American countries. The company is storing fish oil at the plant site and intends to make its first bulk shipment by barge to loading facilities in the Canal Zone in the near future.

Local Panamanian interests with past experience in the fish meal industry in Peru are building a modern new fish meal plant on Taboguilla Island several miles off the coast near Panama City. The total investment will be about \$2 million. The plant is being constructed, as a package deal, by a firm in Essen, West Germany. Their total plant investment will be about \$800,000. Financing has been obtained (5 years at 6 percent) through another firm in West Germany. The only major United States components are a stickwater plant and a burner for the cooker, which is being made in Peru. The remainder of the equipment is being supplied from European and Peruvian sources and includes a German boiler and a Norwegian centrifuge. The plant will have an initial capacity of 50 tons an hour, using 2 suction pumps and 2 processing systems. Most of the equipment, which is of advanced modern design, arrived in Panama early this summer.



Fig. 4 - Panamanian shrimp trawler Tole off Chiriqui coast en route to fishing banks.

The company has arranged for the purchase of 10 standard anchoveta fishing vessels from a Peruvian shipyard at a total cost of \$750,000. Reportedly, the vessels will have steel hulls and be outfitted with the latest fish-finding equipment. Delivery of 2 vessels every 3 months was scheduled to begin in the near future. Financing of the vessels has been arranged with a Peruvian bank

## Panama (Contd.):

over a five-year period. If operations warrant, the new company plans to buy fish from local vessels as well.



Fig. 5 - Shrimp vessels land at the village of Pedregal near David in Chiriqui Province.

As of early summer, buildings and related facilities were being installed at the plant site. A local construction firm was building a deep-water pier at an estimated cost of \$100,000. The facility is designed to permit loading of ships up to 10,000 deadweight tons. Catchment basins, designed to hold 2,000 tons of water, each were being built to store water for the dry season. The company hoped to have the plant in operation by August 1965 and an auxiliary fish oil plant completed by December. It was believed, however, that actual operations probably would not start until early 1966. Local costs were to be met by the Panamanian investors.

It was considered doubtful by some observers that the waters adjacent to Panama City can support more than two fish meal plants. But other informed observers believe fishing conditions would permit additional plants on the Pacific Coast south and east of Panama City. Prospects are not considered good on the Atlantic Coast. Fish

meal will be produced from anchoveta and thread herring which appear off the Panamanian coasts at different periods of the year. The local industry feels it will experience no difficulty selling its product because of the unusually high protein content (65 percent) normally associated with Panamanian fish meal.



Fig. 6 - Closeup of a Panamanian trawler docked at Panama City.

**Other Fisheries:** Panama's major fishery in 1964 centered on the processing and packaging of shrimp principally for export, with sales estimated at over \$7 million. No significant developments occurred during the year in other fisheries. Efforts to stimulate the use of Panama's abundant fish resources by the Government were continued, but with only moderate success. Government officials are particularly hopeful that local industries can be established for the canning of sardines for export and fresh fish for domestic consumption. A local supplier of fishing supplies joined with other local interests to try to encourage the sale of frozen fish in interior regions of Panama, using a refrigeration unit

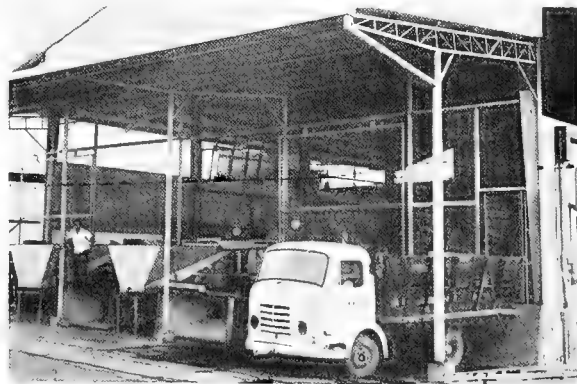


Fig. 7 - Shrimp plant in Panama City. Shrimp are transported from dock by truck in special containers. Shrimp are unloaded from truck, emptied into hoppers, and carried on conveyor belts to washers and sorters.

## Panama (Contd.):

and trucks with enclosed iced beds. Meanwhile, consumer demands are met by independent fishermen, several cooperatives, and from fish caught incidental to shrimp fishing operations.



Fig. 8 - Type of shrimp sorters used by plant in Panama City.

Lobster fishing was considered poor during 1964, with catches landed mostly by small independent operators and with no large-scale production in sight. Panama's largest shrimp producer received an order for 10,000 pounds of scallops this past summer for delivery to New York City. Although the company hopes to increase its scallop business, it recognizes that Panamanian scallops generally are bought in the United States only when domestic catches are low.

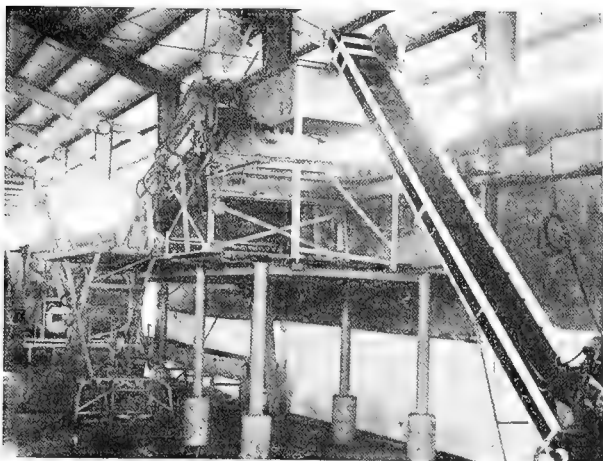


Fig. 9 - Shrimp peeling machine in Panama City plant.

**Fishing Industry Organizations:** In 1964, Panamanian fishermen established an organization called the "Asociacion Nacional de la Industria Pesquera Panameña." That Association has been active politically, principal-

ly pushing for new legislation to benefit the local shrimp industry. The Association also is concerned regarding the increased building of vessels for shrimp fishing within the Republic of Panama. It has urged legislation to limit such construction, as well as to create an effective organization for the control and conservation of the local shrimp fishery. (United States Embassy, Panama, May 1965.)

Note: See Commercial Fisheries Review, Sept. 1964 pp. 88-89.



## Poland

RESEARCH VESSEL SURVEYS  
NORTH ATLANTIC WATERS:

Poland's largest fishery research vessel, the 800-ton Wieczno, called at the Port of Halifax in May 1965 after completing a 35-day survey of fish populations off the coast of Labrador. The vessel, which is under the direction of the Polish Sea Fisheries Institute at Gdynia, was also scheduled to conduct a similar survey on Georges Bank.

In an interview, the vessel's skipper stated that in addition to the Wieczno, Poland operates 4 smaller fishery research vessels which had been working in the North Sea and North-east Atlantic. During this past winter the Wieczno conducted research off West Africa. The data collected will be used in planning future Polish fishing efforts.

As of mid-summer 1965, Poland's 11 large stern factory trawlers were operating in the sea of Labrador. During winter 1964/65 they fished off the coast of West Africa, together with a Soviet fishing fleet. Only one Polish BMRT type vessel, the Uran, was reported on Georges Banks in 1965, but exploratory and research work by the Wieczno May indicate an increased Polish fishing effort in the waters off United States coasts.

Note: See Commercial Fisheries Review, May 1965 p. 85.

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FISHING VESSELS FOR FRENCH AND  
BRITISH FIRMS TO BE BUILT AT GDYNIA:

A French firm has concluded a contract with Poland's Gdynia Shipyards for the delivery of 7 side trawlers to be used in French fisheries for herring and groundfish. The 482-gross-ton vessels are about 150 feet long, with an operating endurance of 24 days, and a crew of 23. (Budownictwo Okretowe, Vol. 10, No. 6, 1965.)

## Poland (Contd.):

Polish Shipyards built about 15 trawlers for French owners during 1960-1962. The performance of those vessels led a British fishery firm in April 1965 to order a trawler from the Gdynia Shipyards.



## Ryukyu Islands

WHITE PAPER ON 1964 FISHERIES:

The Economic Bureau, Ryukyuan Government, on July 19, 1965, released a white paper on the Ryukyuan fisheries for 1964. According to the white paper, 1964 saw a rapid expansion in the catch of the distant-water fishery but the catch of the coastal fishery remained static. The 1964 production totaled 22,162 metric tons, an increase of 4,623 tons (26 percent) over 1963. The distant-water tuna fishery catch totaled 5,240 tons. This was a 95-percent increase since 1961. The coastal fishery production, which has been steadily declining on the average of about 14 percent every year, increased one percent in 1964, totaling 5,323 tons. The most notable change in 1964 was the expansion in the area of operations of the distant-water tuna fishing vessels. A fleet of 25 large tuna vessels engaged in that fishery, with some vessels operating in the South Pacific and others in the Atlantic Ocean.

Production of processed fishery products showed a slight increase, totaling 3,968 metric tons. Of that quantity, 51 percent consisted of kamaboko (fish cake), 24 percent fish hams and sausages, and 23 percent katsuobushi (dried skipjack loin). Production of kamaboko and fish sausages increased and production of katsuobushi decreased (skipjack catch declined by 135 tons in 1964).

The number of people engaged in fishing totaled 10,011, an increase of 38. This is the first increase in the past nine years but it was attributed to an increase in demand for fish protein and to stabilized fish prices, as well as to the decline in farming income. Full-time fishermen totaled 5,973, a decrease of 20. By age groups, 28.3 percent were between 30-39 (largest group) and 17.6 percent between 21-29.

Exports totaled US\$2,730,000, an increase of \$230,000. Of that amount, exports of tuna

landed by Ryukyuan vessels operating from overseas bases comprised 60 percent and exports of coral 18 percent.

Imports totaled \$4,988,000, an increase of \$981,000. Of that amount, canned fish products totaled \$2,283,000, fresh fish \$794,000, and katsuobushi \$694,000. (Shin Suisan Shim-bun Sokuho, July 29, 1965.)



## South Africa Republic

NEW SPINY LOBSTER GROUNDS IN INDIAN OCEAN FISHED BY SOVIETS AND SOUTH AFRICANS:

Recently discovered spiny lobster grounds in the Indian Ocean were described by one South African trawler captain as "absolutely fantastic, and you could never fish them out." The new fishing grounds are located some 90 miles east of the Mozambique coast and are reported to extend for about 95 miles. In early August 1965, at least nine South African trawlers were fishing for spiny lobster in that area, and many more were expected since spiny lobsters have been scarce in Cape waters.

Reports indicated that there were also at least three Soviet trawlers, accompanied by a supply ship and a small survey vessel, exploiting the new lobster grounds. The three Soviet trawlers were described as a stern trawler of at least 1,200 tons and 2 sidetrawlers, estimated at 700 tons each. The Soviet equipment was said to be efficient. One South African captain stated that the Soviet stern trawler captured as many rock lobsters in one haul as his vessel could "in about a week."

The South Africans were concerned over the Soviet practice of simply dumping lobster waste overboard. Scientists of the South African Division of Sea Fisheries have confirmed the harmfulness of the practice, stating that a large amount of discarded lobster waste decomposing under water would produce toxic substances harmful to living spiny lobsters which would either move away or die. An infected area is apparently avoided by the lobsters for years. South African fishermen normally grind up the lobster waste before discarding it. That procedure is said to have no harmful effects. (United States Embassy, Pretoria, August 4, 1965.)



## Spain

### FISHERY TRENDS AT VIGO, APRIL-JUNE 1965:

Landings and Prices: Fishery landings at the Port of Vigo, Spain, in April-June 1965 totaled 19,021 metric tons valued at 234.7 million pesetas (US\$3.9 million), up 40 percent in quantity and 23 percent in value from landings in the first quarter of 1965. As compared with April-June 1964, the second quarter 1965 landings were up 1 percent in quantity and nearly 10 percent in value. Prices dropped during the second quarter of 1965 because the demand from canning plants was light and catches of low-priced horse mackerel were up.

valued at 208 million pesetas (\$3.5 million). This compared with 8,550 tons valued at 157 million pesetas (\$2.6 million) during the previous quarter, and 2,738 tons (value not given) in the second quarter of 1964. Of the total frozen fish landings in April-June 1965, 10,468 tons (about 90 percent) was small hake. Frozen fish sell for about half the price of fresh fish.

Canned Fish Industry: Mainly as a result of the very low sardine catches, activity in the fish-canning industry in April-June 1965 was very limited. Some canneries bought imported frozen tuna (mostly from Japanese vessels) and were thus able to keep busy. Other canneries bought what sardines they

Table 1 - Landings and Average Ex-Vessel Prices of Selected Species at Vigo, April-June 1965 with Comparisons

Species	1965						1964		
	April-June			January-March			April-June		
	Quantity	Average Price		Quantity	Average Price		Quantity	Average Price	
	Metric Tons	Pesetas/Kilo	US\$/Lb.	Metric Tons	Pesetas/Kilo	US\$/Lb.	Metric Tons	Pesetas/Kilo	US\$/Lb.
Octopus . . . . .	3,581	6.84	5.2	3,834	5.07	3.8	3,495	5.03	3.8
Horse mackerel . .	3,315	3.54	2.7	1,617	4.67	3.5	3,431	2.58	2.0
Pomfret . . . . .	2,368	17.23	13.0	131	28.01	21.2	87	14.56	11.0
Small hake . . . .	1,370	36.31	27.5	1,615	38.02	28.8	2,694	29.93	22.6
Sardines . . . . .	549	7.24	5.5	-	-	-	585	5.86	4.4

The beginning of the 1965 sardine season was very discouraging for the second year in a row. The 1964 total sardine catch, however, was not too bad due to the very large and unexpected catches in the third and fourth quarters of that year. Fishermen are hoping for a repetition of those catches this year. The first days of the yellowfin tuna season, which started late in June, yielded a catch of 227 metric tons which sold at the Vigo Exchange at an average

could get and also canned some pomfret and shellfish.

A recent collective agreement has increased salaries for workers in fish canning plants by about 30 percent. This further increases the already high working costs of canneries in the area.

Canned fish exports during April-June 1965 were considerably higher than for previous periods; the increase over the same period a year earlier is estimated to be about double. The increase in the rate of the tax rebate on exports was undoubtedly the main factor for this recovery. (United States Consulate, Vigo, July 16, 1965.)

Note: See Commercial Fisheries Review, July 1965 p. 91.

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### FISH MEAL AND OIL PRODUCTION AND FOREIGN TRADE, 1964:

Production of fish meal in Spain during 1964 increased to 37,109 metric tons from 33,176 in 1963. It is estimated that only about 9 percent of total fishery landings in 1964 was consumed directly by the fish-reduction industry. The bulk of the raw material for the reduction plants is from waste and offal from filleting, canning, and other fish-processing

Table 2 - Distribution of Fishery Landings at Vigo, April-June 1965 with Comparisons

Period	Shipped Fresh to Domestic Markets	Canned	Other Distribution (Smoking, drying, fish meal, etc.) and Local Consumption
	(Metric Tons)		
2nd Quarter 1965	9,643	1,288	8,090
1st Quarter 1965	7,113	1,109	5,330
2nd Quarter 1964	11,013	1,545	6,197

price of 35.31 pesetas a kilo (26.7 cents a pound). During the same period in 1964, 230 tons sold at 32.01 pesetas a kilo (24.2 cents a pound).

Landings of frozen fish by the Vigo trawler fleet (not included with fresh fish landings) during April-June 1965 totaled 11,618 tons



## Spain (Contd.):

industries. Spain's imports of fish meal dropped to 40,457 tons in 1964 from 76,291 in 1963.

Production of fish oil increased to 2,070 tons from 1,811 in 1963. Fish oil imports dropped to 3,525 tons in 1964 from 5,368 in 1963. (Foreign Agriculture, August 9, 1965.)

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#### FISHING FLEET EXPANDS WITH THE ADDITION OF NEW TRAWLERS IN 1964:

During 1964, the Spanish fishing industry continued to develop under the impulse received from the Law for the Renovation of the Fishing Fleet promulgated in 1962. Since then there have been major changes in the long-range Spanish fleet. A large number of new, modern vessels have been built with official assistance or through private initiative. The new vessels have been used throughout the Atlantic, reaching as far as South Africa and South America. Other units are being built and shipbuilders have sufficient orders to keep them busy for at least 2 years.

(Editor's Note: The Law for the Renovation of the Spanish Fishing Fleet granted a concession of 4 billion pesetas or US\$66.7 million for the modernization of the fishing fleet between 1962 and 1971. Under the law, low-interest loans are authorized for 80 per cent of the cost of building new fishing vessels. Preferential treatment is authorized for vessel construction plans which include modern equipment.)

A total of 92 new fishing vessels was added to the Spanish fleet in 1964. Sixteen shipyards in northern and northwestern Spain built those vessels, as well as 2 additional vessels for Chile, 1 for Cuba, and another for France. The new vessels included 58 conventional trawlers without freezing facilities (their catch is packed in ice), 29 freezer trawlers, and 9 trawlers which combine the two systems. Two of the trawlers are easily adaptable and can be used as tuna purse seiners; they have live-bait tanks and the following characteristics: length 36.80 meters (120.7 feet), gross tonnage 290, and a freezing capacity of 20 metric tons a day.

Spanish yards are also building several freezer stern-trawlers to fish for shellfish (mainly shrimp). The main characteristics of the new vessels are: length 20.28 meters (41 feet), gross tonnage 154, hold capacity 50

cubic meters (65.4 cubic yards), and freezing capacity 1.8 metric tons in 24 hours. They are reportedly the first of their type ever built. (United States Consulate, Vigo, July 13, 1965.)

Note: See Commercial Fisheries Review, Mar. 1964 p. 68, and June 1962 p. 62.



## U.S.S.R.

### ANTARCTIC FISHING GROUNDS FOUND BY RESEARCH VESSEL:

The Soviet research vessel Gnevni has completed a 9-months exploratory trip to Antarctica. During the cruise, Soviet scientists discovered several rich fishing grounds. Between the Ross Sea and the Sandwich Islands maximum catches of fish per hour amounted to 20 metric tons. Crustaceans were also extremely abundant in that area.

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### NEW SERIES OF LARGE STERN TRAWLERS TO BE BUILT BY EAST GERMANY:

The Soviet Union concluded a contract in mid-1965 with the People's Shipyards in Stralsund, East Germany, for the delivery of 103 large stern trawlers. Named Atlantik, this new class of fishing vessels will be of 3,200 gross tons, 250 feet long, 40 feet wide, and will have engines generating about 2,600 hp. The trawlers will be able to remain at sea for 2 months. Original plans called for delivery of the first Atlantik vessel by January 1966 but recent reports indicate that due to a speed-up in production at the Stralsund shipyards, the first delivery may be made before the end of 1965.

The new highly-automated vessels will replace the present Tropik series of largest stern trawlers which were also built at Stralsund. The new series will be somewhat larger than the 2,600-gross-ton Tropiks and will have more refrigeration space, greater loading capacity and catch capability, and will also be faster. Because of automation, however, their crews will be smaller than those of Tropik-class trawlers.

The beginning of a new vessel series indicates that East Germany is about to deliver the last of the 65 Tropik stern trawlers which the Soviets ordered in 1961. Despite initial delays and difficulties, East Germany was able to produce about 2 Tropiks a month in

## U.S.S.R. (Contd.):

1964 and in 1965. It is estimated that the Atlantiks will be launched at about the same rate.

Like the Tropiks, the new vessels will fish in the North and Northwest Atlantic, off the North and South African coasts, and will probably be used in expanding Soviet fishing off South American coasts. (United States Mission, Berlin, May 28, 1965, and other sources.)

Note: See Commercial Fisheries Review, June 1965 p. 80.

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UNDERWATER LABORATORY PLANNED:

In the Soviet Union, plans for an underwater laboratory for the study of fish behavior are being prepared by the Leningrad Design Institute of the Fishing Fleet (Giprorybflot). The laboratory will allow 5 hydronauts to stay submerged in depths of up to 300 meters (984 feet) for a maximum of 15 days.

**United Kingdom**FROZEN PROCESSED WHITE FISH SUPPLY SITUATION, JANUARY-MARCH 1965:

British domestic production of frozen white fish products in January-March 1965 totaled 18,599 long tons, a gain of 7 percent over the first quarter of 1964. Imports of frozen white fish were also up in the first quarter of 1965 due mainly to larger shipments from Norway and Iceland. Domestic sales still take the major share of the British frozen white fish pack, but rising exports accounted for 17 percent of total sales in January-March 1965.

In preparing the British domestic pack of frozen white fish in January-March 1965, a total of 36,248 tons of whole fish was used, of which 24,352 tons were cod and codling, and 11,896 tons were other species.

Note: See Commercial Fisheries Review, July 1964 p. 79.

\*\*\*\*\*

SCOTLAND EXPORTS FROZEN SCALLOPS TO EUROPEAN CONTINENT:

Scallops fished off the northwest coast of Scotland are being processed at Mallaig, Scotland, and exported by air to the European continent. In July 1965, three vessels operated by a fishing firm on the Isle of Man were landing good quantities at that Scottish port, most of which were frozen for export.

The freezing plant used at Mallaig was rented by the fishing firm specifically for freezing scallops for export. (Fish Trades Gazette, July 24, 1965.)

\*\*\*\*\*

FISHERY LOAN INTEREST RATES REVISED:

The British White Fish Authority announced that their rates of interest on loans made as from July 17, 1965, would be as follows:

For fishing vessels of not more than 140 feet, new engines, nets and gear: on loans for not more than 5 years;  $7\frac{1}{2}$  percent (increase  $\frac{1}{4}$  percent); on loans for more than 5 years but not more than 10 years,  $7\frac{1}{2}$  percent (increase  $\frac{1}{4}$  percent); on loans for more than 10 years but not more than 15 years,  $7\frac{3}{8}$  percent (increase  $\frac{1}{8}$  percent); on loans for more than 15 years but not more than 20 years,  $7\frac{1}{2}$  percent (increase  $\frac{1}{4}$  percent).

British Supply and Disposition of Frozen Processed White Fish, January-March 1964-1965

Item	January-March 1965			January-March 1964		
	Institutional Pack	Consumer Pack	Total Pack	Institutional Pack	Consumer Pack	Total Pack
..... (Long Tons) .....						
<b>Supply:</b>						
Opening stocks, January 1 . . .	10,841	6,136	16,977	8,914	7,570	16,484
Production . . . . .	7,786	10,813	18,599	7,643	9,681	17,324
Imports . . . . .	4,450	1,383	5,833	3,068	1,835	4,903
<b>Total Supply . . . . .</b>	<b>23,077</b>	<b>18,332</b>	<b>41,409</b>	<b>19,625</b>	<b>19,086</b>	<b>38,711</b>
<b>Disposition:</b>						
Home market sales . . . . .	10,268	9,879	20,147	9,678	9,868	19,546
Exports <sup>1/</sup> . . . . .	2,203	2,015	4,218	1,573	899	2,472
Closing stocks, March 31 . . .	10,606	6,438	17,044	8,374	8,319	16,693

<sup>1/</sup>Includes small quantity of ships' stores and shipments to British Government installations abroad.

Source: British White Fish Authority.

## United Kingdom (Contd.):

The rate to processing plants for loans of not more than 20 years is unchanged at 7 $\frac{3}{4}$  percent.

The rates on advances made before July 17, 1965, are unchanged. (Fish Trades Gazette, July 24, 1965.)

Note: See Commercial Fisheries Review, Sept. 1965 p. 79.

\* \* \* \* \*

**REDUCED SUBSIDY RATES PROPOSED:**

Cuts of 10 percent in operating subsidies for the offshore trawler fleet, the inshore fleet, and herring fishermen were recommended to the British Parliament on July 30, 1965, by the Minister of Agriculture, Fisheries, and Food. The Minister said the rates could be reduced because of the continued improvement in the overall British catch.

White Fish Subsidy: Subsidy payments to offshore vessels are based on time spent at sea while payments to inshore vessels are based on landings.

Following are the proposed new offshore rates for distant-water, middle-water, and near-water vessels:

Type of Vessel	Payment	Per Day at Sea
	<u>£</u>	<u>US\$</u>
<b>Basic Rates for Vessels 80 Feet or More in Length:</b>		
Vessels between 80 and 110 feet . . . .	6.75	18.90
Vessels between 110 and 140 feet . . . .	9.75	27.30
Vessels 140 feet and over . . . . .	11.25	31.50
<b>Special Rates for Vessels 80 Feet or More in Length:</b>		
<b>Motor Vessels:</b>		
Between 80 and 100 feet fishing from Fleetwood . . . . .	3.00	8.40
Between 100 and 110 feet fishing from: North Shields or Hartlepool . . . . .	2.00	5.60
Milford Haven . . . . .	7.00	19.60
Between 110 and 120 feet fishing from Granton or Fleetwood . . . . .	6.00	16.80
Between 120 and 130 feet fishing from Fleetwood or Milford Haven . . . . .	6.00	16.80
Between 160 and 170 feet fishing from Fleetwood . . . . .	6.00	16.80
Oil-burning steam vessels of 170 to 180 feet (built after Dec. 31, 1955) fishing from Fleetwood . . . . .	6.00	16.80
<b>Rates for Vessels Between 60 and 80 Feet:</b>		
Vessels between 60 and 65 feet . . . .	1/5.40	15.12
Vessels between 65 and 80 feet . . . .	6.75	18.90
1/ The same rate applies to seiners under 60 feet which normally make voyages of 8 days or more.		

The subsidy rates for other white fish vessels (inshore vessels under 60 feet in length)

are based on landings. The proposed rates depend on the type of fish landed and vary from 4d. per stone (33.3 U.S. cents per 100 pounds) to 1s. 1 $\frac{1}{2}$ d. per stone (\$1.12 per 100 pounds).

Herring Subsidy: The proposed subsidy rates per day at sea for herring vessels over 40 feet are: vessels of 40 to 60 feet, £5 17s. (\$16.38); vessels of 60 to 80 feet, £6 6s. (\$17.64); and vessels of 80 feet or more, £11 14s. (\$32.76).

Special subsidy rates would be provided for herring landed for reduction. (Fishing News, July 16, 1965, and United States Embassy, London, August 13, 1965.)

Note: See Commercial Fisheries Review, Sept. 1962 p. 109.

**Venezuela****SHRIMP TRANSPORT METHODS:**

United States airborne imports of shrimp from Venezuela in 1964 totaled about 7.1 million pounds. Until early 1965, shrimp shipments from Venezuela to the United States moved almost entirely by air, with two Venezuelan national airlines as the primary carriers. Then in February 1965 small transport vessels entered the field and began handling an increasing share of the exports. By mid-July 1965, the vessels had hauled almost 1,000 metric tons of frozen shrimp from Venezuela to the United States Southern Coast. Shipments aboard the vessels have ranged from 30 to 100 tons.

The cost of shipping frozen shrimp from Maracaibo, Venezuela, to Miami, Fla., by air aboard Venezuelan planes is reported to be about 4 cents a pound, as against a freight cost by sea of 3 cents a pound.

Sea shipment of shrimp from Venezuela may increase during the year. Most of the shrimp plants along the Venezuelan coast are expanding their processing capacity and have expressed an interest in refrigerated vessel transport. (United States Embassy, Caracas, August 21, 1965.)

\* \* \* \* \*

**SHRIMP INDUSTRY EXPANDING:**

Venezuela's shrimp industry in the Maracaibo area experienced a sharp recession in

### Venezuela (Contd.):

the early 1960's, but again is expanding. Maracaibo is located at the mouth of Lago de Maracaibo in the western part of the country. Seven shrimp-processing plants are in operation there. They are supported by shrimp catches of a fleet of 45 trawlers and some 4,000 lake net fishermen. Several of the plants are being equipped with freezing facilities which will increase plant capacity threefold. Processing of individually quick-frozen shrimp will be started before the end of this year. Also, a substantial increase in the trawler fleet is programmed. Approximately the entire production will be exported to the United States.

Observers have noted that if the principal plants succeed in operating at near their projected capacity of 50,000 to 70,000 pounds of processed shrimp daily, Venezuela could expand its export market.

United States shrimp imports from Venezuela totaled 7.9 million pounds in 1964. Of the Latin American countries exporting shrimp to the United States, only Mexico with 72 million pounds and Panama with 12 million pounds outranked Venezuela in 1964 as suppliers of the United States market. (United States Embassy, Caracas, July 24, 1965.)

Note: See Commercial Fisheries Review, July 1965 p. 12, and April 1965 p. 90.

\* \* \* \* \*

### TUNA AND SHRIMP FISHERIES INVESTMENT OPPORTUNITY:

Venezuelan interests are seeking a joint tuna and shrimp fishing venture with United States investors experienced in processing methods. The Venezuelan sponsors have completed a 3-year planning study and taken preliminary steps to organize a new fishery enterprise known as Golfo Internacional de Venezuela C. A. Pesquera.

Authorized capital for the new enterprise is placed at Bs. 4 million (US\$888,888), to be divided equally between Venezuelan and U.S. investors. Additional financing of Bs. 8 million (\$1,777,777) is to be obtained through loans. The development agency of the Venezuelan Government is expected to take Bs. 1 million (\$222,222) of the authorized capital

(Venezuelan share) and to provide Bs. 4 million (\$888,888) of the additional investment requirements.

Plans for the new enterprise include a processing plant at Guiria on the Gulf of Paria. The proposed plant would produce frozen shrimp, frozen tuna fillets, and fish and shellfish meal. The plant is to have a supporting fleet of a mothership with a cargo capacity of 450 metric tons, 9 shrimp vessels, and 2 tuna purse seiners of 110 and 130 tons capacity. One sardine purse seiner of about 100 tons capacity would be needed to supply the fish meal unit. With custom-built vessels, the sponsors feel relatively sure of being able to adequately supply the plant's shrimp requirements. The plant's shrimp production will be exported.

The company expects to be able to purchase from independent vessels a large part of its tuna requirements. (The privilege of importing tuna duty-free has been granted the company by the Venezuelan Government.) A number of foreign tuna vessels, particularly Japanese, fish in the area and are presently transshipping their catch through Port of Spain, Trinidad. On that assumption, capital requirements necessary to put the plant in operation have been placed at Bs. 6 million (\$1,333,333). That only includes the cost of the shrimp fleet. Initial operation is expected to be primarily the processing of frozen shrimp.

The proposed fishing enterprise is in the formative stage and its sponsors are receptive to some modification within the basic proposal which has the Venezuelan Government's approval. Certain concessions have been granted to the company because it proposes to open up a new fishing area believed to be productive, but as yet unproved.

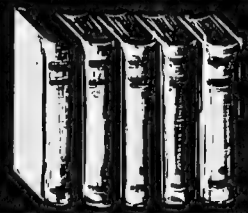
Interested U. S. investors may write directly to Sr. Carlos Chacon, Golfo Internacional de Venezuela C.A. Pesquera, Cuarta Avenida de los Palos Grandes, Edificio Residencias Imperio, Piso 9<sup>o</sup>, Apartamento 94, Caracas, Venezuela. Correspondence may be in English. (United States Embassy, Caracas, July 20, 1965.)

Note: Venezuelan bolivares 4.5 equal US\$1.00.





# FEDERAL ACTIONS



## Agency for International Development

### LOAN TO HELP BANK FOR CHILEAN COOPERATIVES:

A private Cooperative Development Bank to provide financial, technical, and managerial services to Chile's cooperatives (including fishery cooperatives) will be established under the Alliance for Progress with loan assistance from the U. S. Agency for International Development (AID).

A US\$3,650,000 AID loan to IFICOOP (the bank's Spanish initials) will be supplemented by the equivalent of \$384,000 from Chilean sources. The \$4,034,000 total will be used chiefly as "seed" capital for the bank's operations. The bulk of AID loan funds, \$3.3 million, will be for re-lending to Chilean cooperatives including those engaged in farming and fishing, among others. (AID, July 15, 1965.)



## Department of the Interior

### FISH AND WILDLIFE SERVICE

#### BUREAU OF COMMERCIAL FISHERIES

### REVISED U. S. STANDARDS FOR GRADES OF FROZEN RAW BREADED SHRIMP:

Revised U. S. standards for grades of frozen raw breaded shrimp were published in the Federal Register, August 3, 1965, as an amendment to Title 50, Code of Federal Regulations, Part 262.

The proposed revision will upgrade the standards for frozen raw breaded shrimp grades, particularly as concerns: (1) uniformity, (2) condition of coating (batter and breading), and (3) quality loss in shrimp prior to processing. The evaluation factors for flavor and odor would also be upgraded.

Following are the revised standards as published in the Federal Register, August 3, 1965:

## Title 50—WILDLIFE AND FISHERIES

### Chapter II—Bureau of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior

#### SUBCHAPTER G—PROCESSED FISHERY PRODUCTS, PROCESSED PRODUCTS THEREOF, AND PROCESSED FOOD PRODUCTS

### PART 262—U.S. STANDARDS FOR GRADES OF FROZEN RAW BREADED SHRIMP

On pages 3598-3601, inclusive, of the FEDERAL REGISTER of March 18, 1965, there was published a notice and text of a proposed amendment of Part 262—U.S. Standards for Grades of Frozen Raw Breaded Shrimp of Title 50, Code of Federal Regulations.

Interested persons were given 30 days to submit written comments, suggestions, or objections with respect to the proposed amendment. Two responses to the proposal were received.

After consideration of all relevant matters presented, including the proposal set forth in the aforesaid notice, the proposed revised part is hereby adopted with changes and is set forth below.

Four changes are made in the revised part from the revision proposed in the FEDERAL REGISTER of March 18, 1965 (30 F.R. 3598), as follows:

1. Section 262.21(p) Damaged Shrimp (thawed state) was deleted.
2. The phrase "or other methods giving equivalent results" was deleted from § 262.21(v).
3. "+2" was added to the formula in § 262.21(v)(2)(ii) for calculating the percent of shrimp material.
4. Factor 7, Damaged Shrimp, in Table II was deleted.

The revised part is issued pursuant to sections 203 and 205 of Title II of the Agricultural Marketing Act of 1946, 60 Stat. 1087, 1090, as amended, 7 U.S.C. sections 1622 and 1624 (1958), as transferred to the Department of the Interior by section 6(a) of the Fish and Wildlife Act of 1956, 70 Stat. 1122 (1956), 16 U.S.C. section 742e (1958).

This part shall become effective at the beginning of the 30th calendar day following the date of this publication in the FEDERAL REGISTER, *Except*: That the requirements for uniformity, condition of coating, and degree of dehydration, shall

become effective at the beginning of the 120th calendar day following the date of this publication in the FEDERAL REGISTER. This will give the breaded shrimp industry an opportunity to modify and adjust its operations so that it can meet the new requirements of the higher standards of quality for breaded shrimp.

Breaded shrimp inspected and graded in accordance with this revised part between the 30th and the 120th day following the date of this publication in the FEDERAL REGISTER shall meet the requirements for uniformity, condition of coating and degree of dehydration as provided in Part 262—U.S. Grade Standards for Raw Breaded Shrimp and published in the FEDERAL REGISTER (25 F.R. 8444) dated September 1, 1960, as amended by interim regulations published on page 7444 of the FEDERAL REGISTER dated June 5, 1965.

DONALD L. MCKERNAN,  
Director, Bureau of  
Commercial Fisheries.

JULY 30, 1965.

PRODUCT DESCRIPTION, STYLES, TYPES, AND GRADES

Sec.	Product description.
262.1	Styles of frozen raw breaded shrimp.
262.2	Types of frozen raw breaded shrimp.
262.3	Types of frozen raw breaded shrimp.
262.4	Grades of frozen raw breaded shrimp.

FACTORS OF QUALITY

262.11	Ascertaining the grade.
262.12	Factors evaluated on the product in the frozen breaded state.
262.13	Factors evaluated on thawed debreaded product.

DEFINITIONS AND METHODS OF ANALYSIS

262.21	Definitions and methods of analysis.
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LOT CERTIFICATION TOLERANCES

262.25	Tolerances for certification of officially drawn samples.
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**AUTHORITY:** The provisions of this Part 262 issued under section 6, 70 Stat. 1122, 16 U.S.C. section 742e; and sections 203 and 205, 60 Stat. 1087, 1090, as amended, 7 U.S.C. 1622, 1624.

PRODUCT DESCRIPTION, STYLES, TYPES, AND GRADES

§ 262.1 Product description.

Frozen raw breaded shrimp are whole, clean, wholesome, headless, peeled, and deveined shrimp, of the regular commercial species, coated with a wholesome, suitable batter and/or breading. Whole shrimp consist of five or more segments of unutilized shrimp flesh. They are prepared and frozen in accordance with good commercial practice and are maintained at temperatures necessary for the preservation of the product. Frozen raw breaded shrimp contain not less than 50 percent by weight of shrimp material. Individual shrimp and/or pieces consolidated into larger units and covered with breading are not considered for grading under this standard.

§ 262.2 Styles of frozen raw breaded shrimp.

(a) *Style I.* "Regular Breaded Shrimp" are frozen raw breaded shrimp containing a minimum of 50 percent of shrimp material.

(b) *Style II.* "Lightly Breaded Shrimp" are frozen raw breaded shrimp containing a minimum of 65 percent of shrimp material.

§ 262.3 Types of frozen raw breaded shrimp.

(a) *Type I—Breaded fantail shrimp—*  
(1) *Subtype A.* Split (butterfly) shrimp with the tail fin and the shell segment immediately adjacent to the tail fin.

(2) *Subtype B.* Split (butterfly) shrimp with the tail fin but free of all shell segments.

(3) *Subtype C.* Split (butterfly) shrimp without attached tail fin or shell segments.

(b) *Type II—Breaded round shrimp—*  
(1) *Subtype A.* Round shrimp with the tail fin and the shell segment immediately adjacent to the tail fin.

(2) *Subtype B.* Round shrimp with the tail fin but free of all shell segments.

(3) *Subtype C.* Round shrimp without attached tail fin or shell segments.

§ 262.4 Grades of frozen raw breaded shrimp.

(a) "U.S. Grade A" is the quality of frozen raw breaded shrimp that when cooked possesses a good flavor and odor, and that for those factors which are rated in accordance with the scoring system outlined in the following sections the total score is not less than 85 points.

(b) "U.S. Grade B" is the quality of frozen raw breaded shrimp that when cooked possesses a reasonably good flavor and odor, and that for those factors which are rated in accordance with the scoring system outlined in the following sections the total score is not less than 70 points.

(c) "Substandard" is the quality of frozen raw breaded shrimp that fail to meet the requirements of "U.S. Grade B."

FACTORS OF QUALITY

§ 262.11 Ascertaining the grade.

**General.** In addition to considering other requirements outlined in the standard, the following quality factors are evaluated in ascertaining the grade of the product.

(a) Factors not rated by score points: Flavor and odor. Flavor and odor are determined by organoleptic means after the product has been cooked in a suitable manner (§ 262.21(w)).

(b) Factors rated by score points: The quality of the product with respect to factors scored is expressed numerically on the scale of 100. Deductions from the maximum possible score of 100 are assessed for essential variations of quality within each factor. The score of frozen raw breaded shrimp is determined by observing the product in the frozen and thawed states.

§ 262.12 Factors evaluated on the product in the frozen breaded state.

Factors affecting qualities that are measured on the product in the frozen state are: Loose breading and frost, ease of separation, uniformity of size, condition of coating, extraneous material, and damaged breaded shrimp. For the purpose of rating the factors that are scored in the frozen state, the schedule of point deductions in Table 1 applies. This schedule of point deductions is based on the examination of one complete individual package (sample unit) regardless of the net weight of the contents of the package.

§ 262.13 Factors evaluated on thawed debreaded product.

Factors affecting qualities that are measured on the product in the thawed debreaded state are: Degree of deteriora-

tion, dehydration, sand veins, black spot, extra shell, extraneous material, and swimmerets. For the purpose of rating the factors that are scored in the thawed debreaded state, the schedule of point deductions in Table 2 applies. This schedule of point deductions is based on the examination of 20 whole shrimp selected at random from one or more packages. Examinations of this sample of 20 whole shrimp is continued under § 262.21(u).

DEFINITIONS AND METHODS OF ANALYSIS

§ 262.21 Definitions and methods of analysis.

(a) "Fantail shrimp": This type is prepared by splitting and peeling the shrimp except that for subtype A, the tail fin remains attached and the shell segment immediately adjacent to the tail fin remains attached. Subtype B, the tail fin remains, but the shrimp are free of all shell segments. Subtype C, the shrimp are free of tail fins and all shell segments.

(b) "Round shrimp": This type is the round shrimp, not split. The shrimp are peeled except that for subtype A, the tail fin remains attached and the shell segment immediately adjacent to the tail fin remains attached. Subtype B, the tail fin remains, but the shrimp are free of all shell segments. Subtype C, the shrimp are free of all shell segments and tail fins.

(c) Good flavor and odor: "Good flavor and odor", essential requirements for a Grade A product, means that the cooked product has flavor and odor characteristics of freshly caught or well-refrigerated shrimp and the breading is free from staleness and off-flavors and off-odors of any kind. Iodoform is not to be considered in evaluating the product for flavor and odor.

(d) Reasonably good flavor and odor: "Reasonably good flavor and odor" minimum requirement of Grade B products, means that the cooked product may be somewhat lacking in the good flavor and odor characteristics of freshly caught or well-refrigerated shrimp but is free from objectionable off-flavors and objectionable off-odors of any kind.

(e) "Dehydration" refers to the occurrence of whitish areas on the exposed ends of the shrimp (due to the drying of the affected area) and to a generally desiccated appearance of the meat after the breading is removed.

(f) "Deterioration" refers to any detectable change from the normal good quality of freshly caught shrimp. It is evaluated by noting in the thawed product deviations from the normal odor and appearance of freshly caught shrimp.

(g) "Extraneous material" consists of non-edible material such as sticks, seaweed, shrimp thorax, or other objects that may be accidentally present in the package.

(h) Slight: "Slight" refers to a condition that is scarcely noticeable but does affect the appearance, desirability, and/or eating quality of breaded shrimp.

(i) Moderate: "Moderate" refers to a condition that is conspicuously noticeable but that does not seriously affect the appearance, desirability, and/or eating quality of the breaded shrimp.

(j) Marked: "Marked" refers to a condition that is conspicuously notice-



TABLE 1—SCHEDULE OF POINT DEDUCTIONS FOR RATING IN FROZEN BREADED STATE

Factor	Quality description	Deductions allowed
		Points
1. Loose breading or frost.....	2 percent but less than 3 percent..... 3 percent but less than 5 percent..... 5 percent or more.....	5 10 31
2. Ease of separation.....	Separate easily after being removed from carton and exposed to room temperature for not more than 4 minutes. Separate easily after being removed from carton and exposed to room temperature for not more than 6 minutes. Does not separate easily after being removed from carton and exposed to room temperature for 6 minutes.	3 6 10
3. Uniformity.....	Ratio of weight of largest to smallest breaded shrimp in sample unit as defined under section 262.21(U): Up to 1.50..... 1.51-1.60..... 1.61-1.70..... 1.71-1.80..... 1.81-1.90..... 1.91-2.00..... 2.01-2.10..... 2.11-2.20..... 2.21-2.30..... 2.31-2.40..... Over 2.40.....	0 1 2 3 4 5 6 7 8 9 10
4. Condition of coating.....	Degree of halo or balling up or holidays (identify type of defect by circling the proper word): Slight—each 10 percent by count or fraction thereof..... Moderate—each 10 percent by count or fraction thereof..... Marked—each 10 percent by count or fraction thereof..... Excessive—each 10 percent by count or fraction thereof.....	1 1 2 16
5. Damaged breaded shrimp.....	For each 5 percent by count or fraction thereof. Tail fin broken or missing, each 5 percent or fraction thereof (except in Type I, subtype C, and Type II, subtype C).	3 1
6. Extraneous material.....	If extraneous material, except filth or deleterious substances, are found in more than one package per lot, the entire lot shall be declared substandard. <sup>1</sup>	

<sup>1</sup> Filthy or deleterious substances in food products constitute a violation of the Food, Drug, and Cosmetic Act. Products containing such substances are ineligible for the purpose of applying this document.

TABLE 2—SCHEDULE FOR POINT DEDUCTIONS FOR EXAMINATION IN THAWED, DEBREADED STATE

[Subtotals brought forward]

Factor	Quality description	Deductions allowed
		Points
1. Degree of dehydration.....	Slight—each shrimp..... Moderate—each shrimp..... Marked—each shrimp..... Excessive—each shrimp.....	1 2 3 16
2. Deterioration.....	Slight—each shrimp..... Moderate—each shrimp..... Marked—each shrimp..... Excessive—each shrimp (provided that, if excessive deterioration occurs in more than one sample unit per sample, the entire lot shall be declared substandard).	2 5 10 20
3. Sand veins.....	For each dark vein present deduct according to the following schedule: Equivalent in length to two segments..... Equivalent in length to three segments..... Equivalent in length to four or more segments.....	1 2 3
4. Black spot.....	Slight but obvious, on average..... Moderate, on average..... Marked—each shrimp.....	3 6 3
5. Extra shell (see subtype definition).....	(Beyond first segment adjacent to tail fin only for Type I, subtype A, and Type II, subtype A): Less than one whole extra shell segment..... One extra segment or more.....	1 3
6. Swimmerets.....	For last pair only adjacent to tail fins..... For more than last pair.....	1 3
7. Extraneous material.....	If extraneous material, except filth or deleterious substances, are found in more than one package per lot, the entire lot shall be declared substandard. <sup>1</sup>	

<sup>1</sup> Filthy or deleterious substances in food products constitute a violation of the Food, Drug, and Cosmetic Act. Products containing such substances are ineligible for the purpose of applying this document.

able and that does seriously affect the appearance, desirability, and/or eating quality of the breaded shrimp.

(k) Excessive: "Excessive" refers to a condition that is very noticeable and is seriously objectionable and the product cannot be graded above Grade B; this is a limiting rule.

(l) Halo: "Halo" means an easily recognized fringe of excess batter and breading extending beyond the shrimp flesh and adhering around the perimeter or flat edges of a split (butterfly) breaded shrimp.

(m) Balling up: "Balling up" means the adherence of lumps of the breading material to the surface of the breaded coating, causing the coating to appear rough, uneven, and lumpy.

(n) Holidays: "Holidays" means voids in the breaded coating as evidenced by bare or naked spots.

(o) Damaged frozen raw breaded shrimp: "Damaged frozen raw breaded shrimp" means frozen raw breaded shrimp that have been separated into two or more parts or that have been crushed or otherwise mutilated to the

extent that their appearance is materially affected.

(p) Black spot: "Black spot" means any blackened area that is markedly apparent on the flesh of the shrimp.

(q) Sand vein: "Sand vein" means any black or dark sand vein that has not been removed, except for that portion under the shell segment adjacent to the tail fin when present.

(r) Extra shell: "Extra shell" means any shell segment(s) or portion thereof, contained in the breaded shrimp except the first segment adjacent to the tail fin for Type I, subtype A, and Type II, subtype A.

(s) Loose breading and frost: "Loose breading and frost" is considered to be part of the net weight and is determined by use of a balance and by following the steps given below:

1. Remove the overwrap.
2. Weigh carton and all contents.
3. Transfer breaded shrimp to balance and weigh.
4. Weigh carton less shrimp but including waxed separators and inserts (if used), crumbs, and frost.
5. Remove crumbs and frost from carton and separators.
6. Weigh cleaned carton and separators.
7. Calculate loose breading and frost:

Percent loose breading and frost

$$= \frac{(4)-(6)}{(2)-(6)} \times 100.$$

A proportionate amount of the loose breading and frost must be added to the weight of the sample in paragraph (v) (2) (ii) of this section.

(t) Uniformity: "Uniformity" is determined for packs of various sizes by the ratio of the weights of the largest to the smallest breaded shrimp as outlined by the following schedule:

Up to 10 oz.	3 largest/3 smallest
10.1 oz. to 1.5 lb.	6 largest/6 smallest
1.61 lb. to 2.5 lb.	8 largest/8 smallest
Over 2½ lb.	10 largest/10 smallest

(u) Percent shrimp material: "Percent shrimp material" means the percent by weight of shrimp material in a sample as determined by the method described below. This calculation is based on 20 whole shrimp as stipulated in § 262.13.

(1) Equipment needed:

- (i) Two-gallon container approximately 9 inches in diameter.
- (ii) Two-vaned wooden paddle, each vane measuring approximately 1¼ inches by 8¼ inches.
- (iii) Stirring device capable of rotating the wooden paddle at 120 rpm.
- (iv) Balance accurate to 0.01 ounce (0.1 gram).
- (v) U.S. standard sieve—½-inch sieve opening; 12-inch diameter.
- (vi) U.S. standard sieve—ASTM—No. 20, 12-inch diameter.
- (vii) Forceps, with blunt points.
- (viii) Shallow baking pan.
- (ix) Rubber policeman to remove bits of breading from shrimp.

(2) Procedure:

(i) Weigh sample (20 shrimp) to be debreaded. Fill container three-fourths full of water at 70°-80° F. Suspend the paddle in the container leaving a clearance of at least 5 inches below the paddle vanes, and adjust speed to 120 rpm. Add shrimp and stir for 10 minutes. Stack the sieves, the ½-inch mesh over the No. 20 and pour contents of container onto them. Set the sieves under a faucet, preferably with spray attached, and

rinse the shrimp without rubbing the flesh, being careful to keep all rinsings over the sieves and not having the stream of water hit the shrimp on the sieve directly. Use a rubber policeman to remove adhering breading. Lay the shrimp out singly on the sieve as rinsed, split side down and tails up. Remove top sieve and drain on a 45-degree angle for 2 minutes, then transfer shrimp to balance. Rinse contents of the No. 20 sieve onto a shallow baking pan and collect any particles of shrimp material (flesh, tail fin), and add to shrimp on balance and weigh.

(ii) Calculate percent shrimp material:

$$\text{Percent shrimp material} = \frac{\text{Weight of debreaded sample}}{(\text{Weight of sample}) + (\text{weight of sample} \times \text{percentage loose breading and frost})} \times 100 + 2$$

(v) Cooked in a suitable manner: "Cooked in a suitable manner" means cooked in accordance with the instructions accompanying the product. If, however, specific instructions are lacking, the product for inspection is cooked as follows:

(1) Transfer the breaded shrimp, while still frozen, in a wire mesh deep fry basket sufficiently large to hold the shrimp in a single layer without touching one another.

(2) Lower the basket into a suitable liquid oil or hydrogenated vegetable oil at 350°-375° F. Cook for 3 minutes, or

until the shrimp attain a pleasing golden brown color.

(3) Remove basket from the oil and allow the shrimp to drain for 15 seconds. Place the cooked shrimp on a paper towel or napkin to absorb the excess oil.

#### LOT CERTIFICATION TOLERANCES

#### § 262.25 Tolerances for certification of officially drawn samples.

The sample rate and grades of specific lots shall be certified in accordance with Part 260 of this chapter (Regulations Governing Processed Fishery Products, 25 F.R. 8427, Sept. 1, 1960).

\* \* \* \* \*

## U. S. FISHERY LOAN REQUIREMENTS REVISED:

Regulations governing fishery loans have been revised and no longer require that an applicant replace an existing vessel if the loan is to finance the purchase of a new or used vessel, announced Secretary of the Interior Stewart L. Udall on August 13, 1965. Public Law 89-85, signed by the President in July 1965, also expands the purposes for which fishery loan funds may be used and extends the authority to make such loans to June 30, 1970.

The fisheries loan fund, established by a section of the Fish and Wildlife Act of 1956, initially had an authorization of \$10 million, and was increased to \$20 million in 1958.

The loan program authorizes the Secretary of the Interior to make loans for financing and refinancing the operations of commercial fishing vessels and the maintenance, repair, purchase, or construction of such vessels and their gear.

Donald L. McKernan, Director of Interior's Bureau of Commercial Fisheries, which administers the fisheries loan program, said the revised regulations contain the provision that purchase of a new vessel must not cause economic injury to efficient vessel operators working in the area where the new vessel will operate.

Changes in the regulations as published by the Bureau of Commercial Fisheries in the Federal Register, August 11, 1965, follow:

## Title 50—WILDLIFE AND FISHERIES

### Chapter II—Bureau of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior

#### SUBCHAPTER F—AID TO FISHERIES

#### PART 250—FISHERIES LOAN FUND PROCEDURES

Public Law 89-85 amended section 4 of the Fish and Wildlife Act of 1956 extending the period during which the Secretary of the Interior is authorized to make fishery loans and expanding the purposes for which these loans can be made. It further provided that its provisions would become effective July 1, 1965. The revision of procedures set forth herein are those required to meet the provisions of Public Law 89-85. The primary change provides procedures for financing and refinancing loans for the purchase or construction of new or used fishing vessels. Other changes are technical or clarifying in nature. Inasmuch as the revisions contained herein relax current restrictions, and are required to bring the regulations into conformity with Public Law 89-85, the revised procedures

are hereby adopted and will become effective upon the date of publication in the FEDERAL REGISTER.

Part 250 is revised to read as follows:

Sec.	Definition of terms.
250.1	Purposes of loan fund.
250.2	Interpretation of loan authorization.
250.3	Qualified loan applicants.
250.4	Basic limitations.
250.5	Purchase or construction loans.
250.6	Applications.
250.7	Processing of loan applications.
250.8	Approval of loans.
250.9	Interest.
250.10	Maturity.
250.11	Security.
250.12	Books, records, and reports.
250.13	Insurance required.
250.14	Penalties on default.

AUTHORITY: The provisions of this Part 250 issued under sec. 4, 70 Stat. 1121; 16 U.S.C. 742c and P.L. 89-85.

#### § 250.1 Definition of terms.

For the purposes of this part, the following terms shall be construed, respectively, to mean and to include:

- (a) *Secretary*. The Secretary of the Interior or his authorized representative.
- (b) *Person*. Individual, association, partnership or corporation, any one or all as the context requires.

(c) *State*. Any State, the territories and possessions of the United States, the Commonwealth of Puerto Rico, and the District of Columbia.

(d) *Fishery*. A segment of the commercial fishing industry engaged in the catching of a single species or a group of species of fish and shellfish. Any other species taken must be caught incidentally while fishing for and using gear designed for the capture of the species comprising the fishery.

(e) *No economic hardship to efficient vessel operators*. The determination that operation of a proposed vessel will not cause economic hardship to efficient vessel operators already operating in that fishery shall be made by the Secretary, taking into consideration the condition of the resource, the efficiency of the vessels and gear being operated in that fishery compared with the proposed vessel, the prospects of the market for the species caught, and the degree and duration of any anticipated economic hardship.

(f) *Act*. The Fish and Wildlife Act of 1956, as amended.

#### § 250.2 Purposes of loan fund.

The broad objective of the fisheries loan fund created by the Fish and Wild-

life Act of 1956, as amended, is to provide financial assistance which will aid the commercial fishing industry to bring about a general upgrading of the condition of both fishing vessels and fishing gear thereby contributing to more efficient and profitable fishing operations.

(a) Under section 4 of the act, the Secretary is authorized, among other things:

(1) To make loans for financing and refinancing of the cost of purchasing, constructing, equipping, maintaining, repairing or operating new or used commercial fishing vessels or gear.

(2) Subject to the specific limitations in the section, to consent to the modification, with respect to the rate of interest, time of payment of any installment of principal, or security, of any loan contract to which he is a party.

(b) All financial assistance granted by the Secretary must be for one or more of the purposes set forth in paragraph (a) of this section.

#### § 250.3 Interpretation of loan authorization.

The terms used in the act to describe the purposes for which loans may be granted are construed to be limited to the meanings ascribed in this section.

(a) *Commercial fishing vessels or gear.* The words "commercial fishing vessels or gear" mean vessels or gear of any size or type used for the catching of fish or shellfish for commercial purposes such as marketing or processing the catch.

(b) *Purchasing new or used commercial fishing vessels or gear.* The words "purchasing new or used commercial fishing vessels or gear" mean the purchase of vessels or gear.

(c) *Constructing new or used commercial fishing vessels or gear.* The words "constructing new or used commercial fishing vessels or gear" mean the construction of new or reconstruction of used vessels or gear.

(d) *Equipping new or used commercial fishing vessels or gear.* The words "equipping new or used commercial fishing vessels or gear" mean the purchase or installation of parts, machinery, or other items incident to outfitting of vessels or gear.

(e) *Maintaining new or used commercial fishing vessels or gear.* The words "maintaining new or used commercial fishing vessels or gear" mean the normal and routine upkeep of vessels or gear.

(f) *Repairing new or used commercial fishing vessels or gear.* The words "repairing new or used commercial fishing vessels or gear" mean the restoration or replacement of any worn or damaged part of vessels or gear.

(g) *Operating new or used fishing vessels or gear.* The words "operating new or used fishing vessels or gear" mean all phases of activity directly related to the operation of vessels engaged in catching of fish and shellfish by vessels or gear.

#### § 250.4 Qualified loan applicants.

(a) Any citizen residing or conducting business in any State shall be deemed to be a qualified applicant for such financial assistance if such citizen:

(1) Owns or operates a commercial fishing vessel of United States registry (if registration is required) used, or to be used, directly in the conduct of fishing operations, irrespective of the type, size,

power, or other characteristics of such vessel;

(2) Owns or operates any type of commercial fishing gear used directly in the catching of fish or shellfish;

(3) Can demonstrate to the satisfaction of the Secretary that he has the ability, experience, resources and other qualifications necessary for successful operation of the vessel or gear which he proposes to operate.

(4) Is a fishery marketing cooperative engaged in marketing all catches of fish or shellfish by its members pursuant to contractual or other enforceable arrangements which empower the cooperative to exercise full control over the conditions of sale of all such catches and disburse the proceeds from all such sales.

(b) Applications for financial assistance cannot be considered if the loan is to be used for:

(1) Any phase of a shore operation.

(2) Refinancing existing loans that are not secured by the fishing vessel or gear, or debts which are not maritime liens within the meaning of subsection P of the Ship Mortgage Act of 1920, as amended (46 U.S.C. 971).

(3) Refinancing existing mortgages or secured loans on fishing vessels or gear, or debts secured by maritime liens, except in those instances where the Secretary deems such refinancing to be desirable in carrying out the purpose of the Act.

(4) Repair or purchase of fishing gear or vessels where such fishing gear or vessels are not offered as collateral for the loan by the applicant.

(5) Financing a new business venture in which the controlling interest is owned by a person or persons who are not currently engaged in commercial fishing.

#### § 250.5 Basic limitations.

Applications for financial assistance may be considered only where there is evidence that the credit applied for is not otherwise available on reasonable terms (a) from applicant's bank of account, (b) from the disposal at a fair price of assets not required by the applicant in the conduct of his business or not reasonably necessary to its potential growth, (c) through use of the personal credit and/or resources of the owner, partners, management, affiliates, or principal stockholders of the applicant, or (d) from other known sources of credit. The financial assistance applied for shall be deemed to be otherwise available on reasonable terms unless it is satisfactorily demonstrated that proof of refusal of the desired credit has been obtained from the applicant's bank of account: *Provided*, That if the amount of the loan applied for is in excess of the legal lending limit of the applicant's bank or in excess of the amount that the bank normally lends to any one borrower, then proof of refusal should be obtained from a correspondent bank or from any other lending institution whose lending capacity is adequate to cover the loan applied for. Proof of refusal of the credit applied for must contain the date, amount, and terms requested. Bank refusals to advance credit will not be considered the full test of unavailability of credit and, where there is knowledge or reason to believe that credit is otherwise available on reasonable terms from sources other than such banks, the credit applied for cannot be granted notwithstanding the

receipt of written refusals from such banks.

#### § 250.6 Purchase or construction loans.

When the Secretary determines that an application is eligible on its face for the purchase or construction of a new or used vessel that will not replace an existing commercial fishing vessel, a notice shall be published in the FEDERAL REGISTER that such application is being considered and giving all interested parties a period of 30 days to submit evidence that the contemplated operation of such vessel will cause economic hardship or injury to efficient vessel operators already operating in that fishery. If such evidence is received, the Secretary will evaluate it along with such other evidence as may be available to him before making a determination that the contemplated operations of the vessel will or will not cause such economic injury or hardship. The foregoing procedure shall not apply in cases where the applicant seeks to replace a vessel lost or destroyed within 2 years of the date of the application.

#### § 250.7 Applications.

Any person desiring financial assistance from the fisheries loan fund shall make application to the Bureau of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior, Washington, D.C. 20240, on a loan application form furnished by that Bureau except that, in the discretion of the Secretary, an application made other than by use of the prescribed form may be considered if the application contains information deemed to be sufficient. Such application shall indicate the purposes for which the loan is to be used, the period of the loan, and the security to be offered.

#### § 250.8 Processing of loan applications.

If it is determined, on the basis of a preliminary review, that the application is complete and appears to be in conformity with established rules and procedures, a field examination shall be made. Following completion of the field investigation the application will be forwarded with an appropriate report to the Bureau of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior, Washington, D.C. 20240.

#### § 250.9 Approval of loans.

The Secretary will evidence his approval of the loan by issuing a loan authorization covering the terms and conditions for making the loan. Documents executed in connection with a loan shall be in a form approved by the Secretary. Any modification of the terms of a loan following its execution must be agreed to in writing by the borrower and the Secretary.

#### § 250.10 Interest.

The rate of interest on all loans which may be granted is fixed at 5 percent per annum.

#### § 250.11 Maturity.

The period of maturity of any loan which may be granted shall be determined and fixed according to the circumstances but in no event shall the date of maturity so fixed exceed a period of 10 years.

**§ 250.12 Security.**

Loans shall be approved only upon the furnishing of such security or other reasonable assurance of repayment as the Secretary may require. The proposed collateral for a loan must be of such a nature that, when considered with the integrity and ability of the management, and the applicant's past and prospective earnings, repayment of the loan will be reasonably assured.

**§ 250.13 Books, records, and reports.**

The Secretary shall have the right to inspect such books and records of the applicant as the Secretary may deem necessary and to request periodic reports.

**§ 250.14 Insurance required.**

(a) If insurance of any type is required on property under the terms of a loan authorization or mortgage it must be in a form approved by the Secretary and obtained from an underwriter satisfactory to the Secretary and meeting at least one of the following requirements:

(1) An underwriter licensed by an insurance regulatory agency of a State to write the particular form of insurance being written.

(2) A foreign insurance company or club operating in the United States that has deposited funds in an amount and manner satisfactory to the Secretary in a bank chartered under the laws of a State or the United States of America, or in a trust fund satisfactory to the Secretary, which funds are solely for the payment of insurance claims of United States vessels.

(3) A reciprocal or interinsurance exchange licensed by an insurance regulatory agency of a State to write the particular form of insurance being written.

(4) An insurance pool composed entirely of owners and operators of fishing vessels.

(b) Any underwriter (including a company, club, or pool) writing such insurance shall furnish such reasonable financial or operating data as the Secre-

tary may require to determine the standing and responsibility of said underwriter.

**§ 250.15 Penalties on default.**

Unless otherwise provided in the loan documents, failure on the part of a borrower to conform to the terms of the loan documents will be deemed grounds upon which the Secretary may cause any one or all of the following steps to be taken:

(a) Discontinue any further disbursements of funds contemplated by the loan documents.

(b) Take possession of any or all collateral given as security and the property purchased with borrowed funds.

(c) Prosecute legal action against the borrower.

(d) Declare the entire amount of the loan immediately due and payable.

DONALD L. MCKERNAN,  
Director, Bureau of  
Commercial Fisheries.

AUGUST 6, 1965.

\* \* \* \* \*

## HEARINGS ON APPLICATIONS FOR FISHING VESSEL CONSTRUCTION DIFFERENTIAL SUBSIDY:

Wallace J. Boudreaux, Brownsville, Tex., applied for a fishing vessel construction differential subsidy to aid in the construction of an 82-foot overall steel vessel to engage in the fishery for shrimp (including royal-red shrimp), Atlantic tuna, snapper, and spiny lobster. Hearing was held. The U. S. Bureau of Commercial Fisheries published the notice of the application and hearing in the Federal Register, August 6, 1965.

American Stern Trawlers, Inc., New York, N. Y., applied for a fishing vessel construction differential subsidy to aid in the construction of a steel vessel with a length between perpendiculars of 262 feet to engage in the fishery for groundfish and whiting. Hearing was held September 14, 1965.

Mussel, Inc., New Bedford, Mass., applied for a fishing vessel construction differential subsidy to aid in the construction of an 88-foot overall steel vessel to engage in the fishery for groundfish, lobster, swordfish, flounder, and scallops. Hearing was held September 16, 1965.

The Bureau published the notice of the applications and hearings in the Federal Register, August 12, 1965.

Applications for fishing vessel construction differential subsidies to aid in the construction of 86-foot overall steel vessels were

received from two more firms in Brownsville, Tex.: Tatum Fisheries, Inc. (hearing held September 30, 1965), and Texas Fisheries, Inc. (hearing held October 5, 1965.)

Each of those firms applied separately for a subsidy to build its own vessel to engage in the fishery for shrimp (including royal-red shrimp), spiny lobster, Atlantic tuna, swordfish, snappers, and grouper.

Another application was received from Boat Jupiter, Inc., New Bedford, Mass. (hearing held September 28, 1965), for a fishing vessel construction differential subsidy to aid in the construction of a 90-foot overall wooden vessel to engage in the fishery for scallops, groundfish, flounder, and lobster.

The Bureau published the notice of the applications and hearings in the Federal Register, August 13, 1965. Hearings on the economic aspects of the applications were held.

Note: See Commercial Fisheries Review, August 1965 p. 100.



## Department of Labor

WAGE AND HOUR AND PUBLIC CONTRACTS DIVISIONS

### HEARINGS HELD ON INDUSTRY WAGE RATES IN AMERICAN SAMOA:

A special Industry Committee appointed by the Secretary of Labor to review minimum wage rates under the Fair Labor Standards

Act for American Samoan industries completed in July 1965 its public hearings in Pago Pago, American Samoa. Tuna canneries there were included in the hearings since the minimum wage for tuna cannery workers in American Samoa is less than the mainland minimum wage. The committee did not recommend any change at this time in the present minimum wage rate of \$1.00 an hour for workers engaged in fish canning and processing. No change was recommended for the minimum wage rates in other industries except the petroleum marketing industry.

The Fair Labor Standards Act authorizes industry committees to recommend minimum wage rates for American Samoan industries at or below the statutory minimums that apply on the mainland. Composed of residents of both American Samoa and the continental United States, the committees are equally representative of employees, employers, and the public.

The recommendations of the Industry Committee on industries in American Samoa were published in the Federal Register, August 7, 1965, and became effective August 23, 1965.

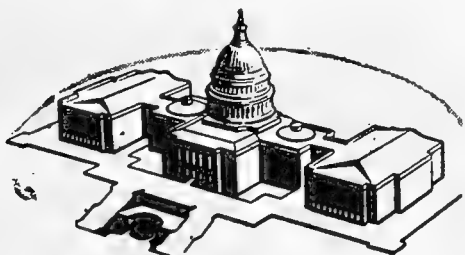
Notes: (1) See Commercial Fisheries Review, July 1965 p. 103.

(2) Copies of the wage order, the Committee's Report, Findings of Fact and Recommendations, are available from offices of the U. S. Labor Department's Wage and Hour Contracts Divisions, Washington, D. C.



## Eighty-Ninth Congress (First Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and



allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.

**ALASKAN ECONOMY:** Sen. Bartlett inserted in Congressional Record (pp. 20878-20882), Aug. 25, 1965, a report on the Alaskan economy of 1964, published by the Institute of Business, Economic and Government Research of the University of Alaska. One section discusses Alaska's fisheries industry.

**ANADROMOUS FISH CONSERVATION:** Subcommittee on Fisheries and Wildlife Conservation of House Committee on Merchant Marine and Fisheries Aug. 19, 1965, met and ordered reported favorably to the full Committee H. R. 23 (amended), to authorize the Secretary of the Interior to initiate a program for the conservation, development, and enhancement of the Nation's anadromous fish in cooperation with the several States.

House Committee on Merchant Marine and Fisheries Sept. 8, 1965, ordered bill reported favorably to the House.

**ANTIDUMPING ACT AMENDMENT:** H. R. 10619 (Fulton of Pa.) introduced in House Aug. 24, 1965, to amend the Antidumping Act, 1921; to Committee on Ways and Means.

**CHESAPEAKE BAY OYSTER PRODUCTION:** Sen. Tydings Congressional Record, Sept. 1, 1965 (pp. 21755-21756) spoke in the Senate concerning the decline of oyster production in the Chesapeake Bay. He inserted this article by Leonard Dowie, Jr., which appeared in the Aug. 15 Washington Post: "Maryland Better Clam Up About Her Oysters." The article tells of the natural and manmade problems--mud erosion, hurricanes, and premature harvesting--which have beset the bay for many years.

**ECOLOGICAL RESEARCH AND SURVEY:** H. R. 10766 (Ottinger), Aug. 31, 1965, introduced in House, to authorize the Secretary of the Interior to conduct a program of research, study and surveys, documentation, and description of the natural environmental systems of the United States for the purpose of understanding and evaluating the condition of these systems and to provide information to those concerned with natural resources management, and for other purposes; to Committee on Interior and Insular Affairs. Includes a section authorizing participation in environmental research in surrounding oceans in cooperation with other countries or with international organizations.

**FACTORY FISHING VESSELS:** Rep. Tupper (Maine) in extension of remarks in Congressional Record (pp. 21020-21021), Aug. 25, 1965, expressed hope that all members will study H. R. 10215. Bill would empower the Secretary of the Interior to take appropriate action to construct and outfit three factoryships of the most advanced design and with the latest gear and equipment, and authorize the Secretary to lease each vessel to the highest responsible bidder for a term of not more than 3 years. Bidders must be U. S. citizens or U. S. firms. He further states that "there are two principal things we must do to help the fishing industry in the United States: first, we must increase the demand for fish and fish products in the United States, and second, we must rebuild our U. S. fishing fleet." In order to accomplish these basic purposes, he stated, we must improve the quality of fish and fish products both before it gets to the marketplace and also in the nation's restaurants; and we must eliminate the disagreement and bickering in the fishing industry itself so as not to impede the rebuilding of our U. S. fishing fleet.

**FISHERMEN'S ORGANIZATION AND COLLECTIVE BARGAINING:** Subcommittee on Merchant Marine and Fisheries of Senate Committee on Commerce, Aug. 5, 1965, held and concluded hearings on S. 1054, assuring bargaining rights of fishermen's organizations in the ex-vessel sale of fish on which the livelihood of their members depends. Testimony received from Donald L. McKernan, Bureau of Commercial Fisheries, Department of the Interior.

**FISH FARMING:** H. R. 10626 (Mills) introduced in House Aug. 24, 1965, to amend the Consolidated Farmers Home Administration Act of 1961 in order to increase the amount for which loans may be made under such for fish farming; to Committee on Agriculture.

**FOOD IRRADIATION PROGRAM:** Rep. Price inserted in Congressional Record (p. A4709), Aug. 23, 1965, an article which appeared in the Washington, D. C., Evening Star, Aug. 15, 1965, entitled "Irradiated Foods for Tomorrow's Dinners."

**FOOD MARKETING NATIONAL COMMISSION:** Sen. Hart (Congressional Record, Aug. 5, 1965, pp. 18827-18828) inserted the interim report of the National Commission on Food Marketing which was filed on July 1, 1965, summarizing the work accomplished since its establishment last summer and indicating the areas that will be explored in the year ahead.

**FOREIGN AID AND FISHERIES JURISDICTION:** The Committee on Conference on the disagreeing votes of the two Houses on the amendment of the Senate to the bill H. R. 7750, the proposed Foreign Assistance Act of 1965, submitted Aug. 18, 1965, a conference report (H. Rept. No. 811). An excerpt from the conference report concerning harassment of U. S. fishing vessels follows: "The Senate amendment added a new subsection 620(o) to the act under which no assistance could be furnished under the act to any country which (1) has extended, or hereafter extends, its jurisdiction for fishing purposes over any area of the high seas beyond that recognized by the United States, and (2) hereafter imposes any penalty or sanction against any U. S. fishing vessel on account of its fishing activities in such an area. The amendment did not apply to extensions of jurisdiction pursuant to international agreement to which the United States is a party."

"The House bill did not contain a comparable provision.

"The managers on the part of the House agreed to a compromise which eliminates the rigid prohibitions against supplying U. S. Assistance\*\*\* but requires that consideration be given to the behavior of recipients of our aid with respect to these problems in determining the nature and amount of aid to be provided. Language was accepted, indicating that consideration should be given to excluding from U. S. assistance any country which imposes any penalty or sanction against any U. S. fishing vessel on account of its fishing activities in international waters rather than a requirement that aid be terminated under such circumstances.

"The managers on the part of the House agreed that the United States should give consideration to the treatment of U. S. fishing vessels by foreign governments in determining the nature and amount of U. S. assistance made available to such governments. At the same time, they recognized that a complete prohibition of aid to governments interfering with U. S. vessels might in certain instances prevent the attainment of U. S. foreign

policy objectives and adversely affect the entire program of the Alliance for Progress."

Chapter I of Part III of the Foreign Assistance Act of 1961, as amended, which relates to general provisions would be amended by adding a new subsection 620(o) as follows:

"In determining whether or not to furnish assistance under this Act, consideration shall be given to excluding from such assistance any country which hereafter seizes, or imposes any penalty or sanction against, any United States fishing vessel on account of its fishing activities in international waters. The provisions of this subsection shall not be applicable in any case governed by international agreement to which the United States is a party."

House Aug. 19, 1965, called up, considered, and adopted conference report (H. Rept. No. 811) on H. R. 7750. Adopted conference report language for curtailment of foreign aid to countries harassing U. S. vessels fishing in offshore waters. Senate Aug. 24, 1965, adopted conference report on H. R. 7750. These actions cleared bill for the President's signature.

H. R. 7750, authorizing funds for foreign aid for fiscal year 1966, was signed by the President Sept. 6, 1965 (P. L. 89-171). Retains language curtailing foreign aid to countries harassing U. S. vessels fishing in offshore waters.

**HALIBUT COMMISSION:** Subcommittee on Fisheries and Wildlife Conservation of House Committee on Merchant Marine and Fisheries Aug. 19, 1965, reported favorably to the full committee H. R. 9734, to amend the Northern Pacific Halibut Act in order to provide certain facilities for the International Pacific Halibut Commission.

The Department of the Interior recommended enactment of this bill to provide a headquarters office and laboratory facilities for the International Pacific Halibut Commission at the University of Washington. In a letter to the House Merchant Marine and Fisheries Committee, the Deputy Assistant Secretary of the Interior for Fish and Wildlife, and Parks said the Department approves H. R. 9734 which would amend the Northern Pacific Halibut Act by authorizing the Secretary of State to provide the facilities on or near the University campus. The Commission now occupies space on the campus, but its use will terminate in the fall of 1966. The proposed facilities would provide approximately 12,000 square feet of floor space at an estimated cost of \$500,000.

House Committee on Merchant Marine and Fisheries Sept. 8, 1965, ordered bill favorably reported to the House.

**HEALTH, EDUCATION, AND WELFARE APPROPRIATIONS, FY 1966:** S. Rept. 537, Departments of Labor and Health, Education, and Welfare, and Related Agencies Appropriation Bill, 1966 (Aug. 3, 1965, report from the Committee on Appropriations, U. S. Senate, 89th Congress, 1st session, to accompany H. R. 7765), 95 pp., printed. Committee reported the bill to the Senate with various amendments. Under the Public Health Service, Committee added planning funds for an addition to the Narragansett Shellfish Laboratory in Rhode Island and additional funds for the Federal water pollution control program.

Senate Aug. 5, 1965, passed after adoption of all committee amendments en bloc (which were thereafter con-



sidered as original text for purpose of further amendment) H. R. 7765, fiscal 1966 appropriations for the Departments of Labor, and Health, Education, and Welfare, and related agencies. Includes funds for botulism research under the Food and Drug Administration; water pollution control under Office of the Secretary; pesticide activities, water supply and water pollution control, shellfish sanitation program, and botulism under the Public Health Service. Same day Senate asked for a conference. House Aug. 11, 1965, disagreed to Senate amendments, agreed to a conference requested by the Senate, and appointed conferees.

Committee of Conference submitted to House Aug. 12, 1965, conference report (H. Rept. 791) on H. R. 7765. House Aug. 16 and Senate Aug. 17, 1965, adopted the conference report.

H. R. 7765 was signed by the President Aug. 31, 1965 (P. L. 89-156).

**INLAND GREAT LAKES AND WESTERN RIVERS RULE FOR SMALL VESSELS:** Senate Committee on Commerce, Sept. 2, 1965, reported (S. Rept. 675) on S. 1349, to amend the inland Great Lakes, and western rivers rules concerning sailing vessels and vessels under 65 feet in length. Senate Sept. 8, 1965, passed without amendment and cleared bill for the House.

House Sept. 9, 1965, referred Senate-passed S. 1349 to Committee on Merchant Marine and Fisheries.

**LIENS FOR LEASED VESSEL EQUIPMENT:** Introduced in Senate Aug. 25, 1965, S. 2454 (Kennedy of Mass.) and introduced in House Sept. 1, 1965, H. R. 10829 (O'Neill of Mass.), to authorize liens of value of secured equipment used solely for navigation or fishing on a vessel of the United States and to permit the recording of such liens; to Committee on Commerce and Committee on Merchant Marine and Fisheries, respectively. Sen. Kennedy in the Senate pointed out (Congressional Record, p. 20852, Aug. 25, 1965) that bill would seek to insure protection to suppliers who provide equipment to the fishing industry under such forms of security as leases, conditional sales contracts, chattel mortgages, and other means, thus helping the fishing industry improve its condition and expand its operations. He states: "...some of these suppliers in Massachusetts have indicated to me that there is a growing reluctance to furnish this equipment because they have not been permitted to record with the Collector of Customs any notice of their claim and description of their security. In certain instances, the suppliers have lost title to their equipment because their security was not known to other lienors."

**METRIC SYSTEM:** H. R. 10329 (Miller) introduced in House Aug. 9, 1965, to provide that the Secretary of Commerce shall conduct a program of investigation, research, and survey to determine the practicability of the adoption by the United States of the metric system of weights and measures; to Committee on Science and Astronautics.

House Committee on Science and Astronautics, Aug. 10, 1965, met in executive session and ordered reported favorably H. R. 10329 (a clean bill introduced). House Committee Aug. 24, 1965, reported (H. Rept. 850) on H. R. 10329; referred to Committee of the Whole House on the State of the Union.

H. Rept. 850, Providing for the Secretary of Commerce to Conduct a Program of Investigation, Research,

and Survey of the Metric System in the United States (Aug. 24, 1965, report from the Committee on Science and Astronautics, House of Representatives, 89th Congress, 1st session, to accompany H. R. 10329), 7 pp., printed. Committee reported bill favorably without amendment. Discusses purpose, committee recommendations, cost and budget data, and department recommendations. House Committee on Rules Sept. 9 deferred action on bill.

**MINIMUM WAGE:** Introduced in House Aug. 4, 1965, H. R. 10275 (Roosevelt), the proposed Fair Labor Standards Amendments of 1965; to Committee on Education and Labor. Would require all employee commercial fishermen to be paid the required minimum hourly wage rate during any workweek. Since this would be newly covered employment, the required minimum wage would be not less than \$1.00 per hour beginning Jan. 1, 1966; not less than \$1.15 per hour beginning July 1, 1967; not less than \$1.40 per hour beginning July 1, 1968; not less than \$1.60 per hour beginning July 1, 1969; and not less than \$1.75 per hour beginning July 1, 1970. For shoreworkers in the industry the bill proposes to raise the minimum wage rate to not less than \$1.40 per hour beginning July 1, 1966; not less than \$1.60 per hour beginning July 1, 1967; and not less than \$1.75 per hour beginning July 1, 1968. Piece work or other bases of wage computation must work out to the hourly rates prescribed. Bill continues the present exemption from overtime pay requirements for the fishing industry, including on-shore operations.

House Committee on Education and Labor met Aug. 10, 1965, on H. R. 10275; no announcements were made. Same Committee Aug. 17, 1965, approved bill for reporting to the House, but a clean bill (H. R. 10518) was introduced.

H. R. 10518 (Roosevelt) introduced in House Aug. 17, 1965, to amend the Fair Labor Standards Act of 1938 to extend its protection to additional employees, to raise the minimum wage, and for other purposes; to Committee on Education and Labor.

On Aug. 18, 1965, Committee ordered reported favorably to House H. R. 10518; the reference to fishery employees, as contained in the earlier version (H. R. 10275) was omitted. At this stage, then, it appeared that the amendments to the Fair Labor Standards Act will make no change affecting any element of the commercial fishing industry.

The Committee version of H. R. 10275, which is H. R. 10518, as reported out by the Committee does not propose any changes in the present fishery exemptions under the Fair Labor Standards Act. (The Subcommittee had proposed the repeal of the minimum wage exemptions for offshore fishery employees under H. R. 10275). But the bill still provides for an increase in the present minimum wage for covered employees as per the previous bill. Also provides a three-step increase over the present level for employees in Puerto Rico—an increase of 12 percent within 60 days after July 1, 1966; 16 percent at the end of the first year; and 12 percent at the end of the second year.

Committee reported (H. Rept. 871) to the House Aug. 25, H. R. 10518. H. Res. 546 (Powell) introduced in House Aug. 25, provides for consideration of H. R. 10518; to Committee on Rules.

**NATIONAL SEA GRANT COLLEGES AND PROGRAM ACT OF 1965:** S. 2439 (Pell) introduced in Senate Aug.

19, 1965, to amend the National Science Foundation Act of 1950, as amended, so as to authorize the establishment and operation of sea grant colleges and programs by initiating and supporting programs of education, training, and research in the marine sciences and a program of advisory services relating to activities in the marine sciences, to facilitate the use of the submerged lands of the Outer Continental Shelf by participants carrying out these programs, and for other purposes; to Committee on Labor and Public Welfare. Sen. Pell in Congressional Record (pp. 20380-20382), Aug. 19, 1965, pointed out that the bill would provide for the establishment and development of national sea grant colleges and an educational program geared to the beneficial use of our vast marine resources. The short title of this bill is the National Sea Grant Colleges and Program Act of 1965. Would provide for a greatly increased educational program in the practical side of oceanography, aquaculture, marine mining, and related fields. It would also expand research leading to results of a direct and practical nature, of immediate value to those working in the marine sciences. Finally, it would create an extension service to spread useful information regarding the exploitation of the immense marine resources available to this Nation.

**NATURAL RESOURCES DEPARTMENT:** S. 2435 (Moss and 2 others) introduced in Senate Aug. 19, 1965, to redesignate the Department of the Interior as the Department of Natural Resources and to transfer certain agencies to and from such department; to Committee on Government Operations. Sen. Moss in Congressional Record (pp. 20378-20380), Aug. 19, 1965, pointed out that the bill provides for a Secretary of Natural Resources and a Deputy Secretary. Provides for two Under Secretaries--one for water and power, and one for lands and forests. Responsibility of the Under Secretary for Lands and Forests would be divided into three branches, each headed by an Assistant Secretary--the National Park Service, the Fish and Wildlife Service, and the Bureau of Outdoor Recreation could report to an Assistant Secretary for Recreation and Wildlife.

Sen. Moss (Congressional Record, Sept. 1, 1965, pp. 21744-21748) spoke in the Senate concerning the comments which his bill (S. 2435) has received. He inserted an analysis of the bill which appeared in the Aug. 25, 1965, Deseret News of Salt Lake City, Utah, entitled "Make Our Resources Count." He also inserted three proposals on reorganization of the water resource development activities of the Federal Government as background and discussion material--"The Case for a Department of Natural Resources," University of New Mexico School of Law, Nov. 1961; position paper, "Reorganization of Federal Natural Resource Agencies"; and "A Basic Reorganization for Both Efficiency and Improved Resource Conservation: Consolidation of Agricultural, Natural Resource and Rural Program Agencies."

**NORTH PACIFIC FISHERIES TREATY:** Rep. Pelly inserted in Congressional Record (pp. A4627-4628), Aug. 18, 1965, copy of resolution: "Washington State Labor Council Boycott of Japanese Imports, Resolution No. 34, Aug. 12, 1965." Council, which represents 95 percent of all organized labor in the State of Washington, urges immediate Federal legislation to protect North American stocks of salmon and promised a complete boycott of Japanese imports if Japan fails to abide by conservation principles relating to those fish.

Rep. Pelly pointed out in Congressional Record (pp. A4632-A4633), Aug. 18, 1965, that the success of some of the 1965 Bristol Bay salmon runs in Alaska does not

represent in any way that a solution to the North Pacific salmon problem has been found.

Sen. Gruening inserted in Congressional Record (pp. 20493-20495), Aug. 23, 1965, an article which appeared in the New York Times, Aug. 19, 1965, entitled "The Salmon is King to Cannerymen (and Cooks) in the Alaskan Wilderness." He also inserted a second article entitled "Best Cooks in Alaska: The Hospitable Norse."

**OCEANOGRAPHIC AGENCY OR COUNCIL:** National Oceanographic Council: Hearings before the Committee on Commerce, United States Senate, 89th Congress, 1st session on S. 944, a bill to provide for expanded research in the oceans and the Great Lakes, to establish a National Oceanographic Council, and for other purposes; Feb. 19, Mar. 16, and April 12, 1965; Serial 89-21, 194 pp., printed. Contents include statements and letters of various Federal officials, members of Congress, business firms, university and institute officials, and associations. Appendixes include these documents: "Preparation of Oceanographic Program," "National Oceanographic Data Center," "Potential Resources of the Ocean," and "Preliminary Plan for Expansion of Oceanographic Research, etc."

S. 944, to provide for expanded research and development in the marine environment of the United States, to establish a National Oceanographic Council on Marine Resources and Engineering Development, and a Commission on Marine Science, Engineering, and Resources, was reported (S. Rept. 528) with amendments by the Senate Committee on Commerce, July 29. The Committee completely revised the bill, substituting new and broader language for the original text. The title of the bill was amended. Would establish a National Council in Marine Resources and Development. The Vice President would be Chairman of the Council, and the members of the Council would include the Secretaries of Interior, State, Commerce, Health, Education, and Welfare, and the Navy, as well as the Chairman of the Atomic Energy Commission and the Director of the National Academy of Sciences. Function of the Council would be to advise and assist the President "with respect to the performance of Federal functions in the field of marine science and engineering, including, but not limited to the following functions: (1) survey all significant marine science activities, including the policies, plans, programs, and accomplishments of all departments and agencies of the United States engaged in such activities; (2) develop a comprehensive program of marine science activities, including, but not limited to, exploration, exploitation, and conservation of the resources of the marine environment, marine engineering studies of air-sea interaction, transmission of energy, and communications, to be conducted by departments and agencies of the United States; (3) designate and fix responsibility for the conduct of marine science activities by departments and agencies of the United States, including but not limited to, exploration, exploitation, and conservation of the resources of the marine environment, marine engineering, studies of air-sea interaction, transmission of energy, and communications; (4) provide for effective cooperation among all departments and agencies of the United States engaged in marine science activities, and specify, in any case in which primary responsibility for any category of the marine science activities has been assigned to any department or agency, which of those activities may be carried on concurrently by other departments or agencies; (5) resolve differences arising among departments and agencies . . . with respect to marine science activities under this Act . . .

(6) review annually all marine science activities conducted by departments and agencies of the United States . . . ; (7) undertake a comprehensive study of the legal problems arising out of the management, use, development, recovery, and control of the resources of the marine environment; and (8) establish long-range studies of the potential benefits to the United States economy, security, health, and welfare to be gained from marine resources, engineering, and science." In addition, the Council would be authorized to "coordinate a program of international cooperation in work done pursuant to this Act . . . . The revised bill would also set up a Commission on Marine Science, Engineering, and Resources, composed of 15 members representing government, industry, and scientific institutions. In addition to cooperating with the Council in the 8 areas listed above, the Commission would be directed to "survey the marine science activities of the United States, make recommendations for the most effective organizational structure for conduct of Federal activities in this area, and make recommendations for the encouragement of private investment in marine and resource development." Would authorize the appropriation of "such sums as may be necessary," with the provision that the appropriations would not exceed \$1 million for any given fiscal year. The provisions of the Act would expire on June 30, 1970.

S. Rept. 528, Marine Resources and Engineering Development Act of 1965 (July 29, 1965, report from the Committee on Commerce, U. S. Senate, 89th Congress, 1st session, to accompany S. 944), 17 pp., printed. Committee reported bill favorably with amendments. Presents committee amendment in the nature of a substitute; discusses purpose, background, need for legislation; the United States and the world ocean; a new continent--the Continental Shelf; resources of the marine environment; minerals of the deep-ocean floor; nuclear power for ocean research, mining and exploitation; agency comments.

Senate Aug. 5, 1965, passed with committee amendment (motion to reconsider tabled) S. 944. Committee amendment inserted in the Record.

House Aug. 9, 1965, received for concurrence Senate-passed S. 944; to Committee on Merchant Marine and Fisheries.

H. R. 10432 (Matsunaga) introduced in House Aug. 12, 1965, to provide for expanded research and development in the marine environment of the United States, to establish a National Council on Marine Resources and Engineering Development, and a Commission on Marine Science, Engineering and Resources, and for other purposes; to Committee on Merchant Marine and Fisheries.

Sen. Magnuson inserted in Congressional Record, (pp. 21404-21405), Aug. 30, 1965, this editorial published in the Seattle Times of August 23: "The Oceans' Importance." It points out the strong necessity for the Government to devote more attention to the correlation and coordination of a program of oceanography within the Government departments. Sen. Magnuson stated that he hopes action will be taken soon on the bill (S. 944) which he introduced along those lines.

Subcommittee on Oceanography of House Committee on Merchant Marine and Fisheries Sept. 8, 1965, ordered reported favorably to the full committee S. 944, with amendments.

H. R. 10979 (Gibbons) introduced in the House Sept. 9, 1965, to provide for expanded research and development in the marine environment of the United States, to establish a National Council on Marine Resources and Engineering Development, and a Commission on Marine Science, Engineering and Resources, and for other purposes; to Committee on Merchant Marine and Fisheries.

OCEANOGRAPHY: Committee Print, Abridged Chronology of Events Related to Federal Legislation for Oceanography 1956-65, 89th Congress, 1st session, prepared by the Library of Congress Legislative Reference Service, July 15, 1965 (Revised July 21, 1965), 30 pp., printed. Part I is a chronology, beginning with landmark events in 1956, that highlights legislatively significant action by both the President and the Congress; Part II contains explanatory notes which elucidate contents of the earlier list; Part III is a brief summary of Federal funding in oceanography, by agency and functional area; Part IV contains a summary of congressional action by the 86th, 87th, 88th, and 89th Congress related to oceanographic legislation; and Part V is a selected bibliography of those papers and articles bearing on elements of oceanography of legislative rather than scientific interest.

Subcommittee on Oceanography of House Committee on Merchant Marine and Fisheries Aug. 10-13, 1965, held a hearing on various bills relating to the National Oceanographic Program. Meeting continued Aug. 17, with testimony by Director, Bureau of Commercial Fisheries. Hearings concluded Aug. 19.

Rep. Keith, Congressional Record (p. A4750), Aug. 24, 1965, called attention to the dramatic contribution that Sea Lab II is making to our fund of useful knowledge on oceanography. He stated that a team of skin divers is preparing to swim down to the bottom of the Pacific Ocean to live in a house under the sea. The house is a 12- by 58-foot cylinder called Sea Lab II in which the aquanauts are able to work and sleep for up to 45 days at a depth of 210 feet. Among other things, the team will conduct studies of the forms of life and minerals on or near the sea floor.

Subcommittee on Oceanography of House Committee on Merchant Marine and Fisheries met in executive session Sept. 1, 1965, on pending legislation. No announcements were made.

ORDERLY MARKETING ACT OF 1965: Introduced in House Aug 26, 1965, H. R. 10704 (Hathaway) and H. R. 10734 (Cleveland) Aug. 30, to provide for the orderly marketing of articles imported into the United States, to establish a flexible basis for the adjustment by the U. S. economy to expanded trade, and to afford foreign supplying nations a fair share of the growth or change in the U. S. market; to Committee on Ways and Means.

PESTICIDES AND FISH AND WILDLIFE: Subcommittee on Fisheries and Wildlife Conservation of House Committee on Merchant Marine and Fisheries Aug. 19, 1965, met and ordered reported favorably to the full committee S. 1623, to authorize such sums as may be necessary to carry out the continuing study by the Secretary of the Interior of the effects of insecticides, herbicides, fungicides, and other pesticides upon fish and wildlife. House Committee Sept. 8, 1965, ordered bill favorably reported to the House.

SCIENCE AND TECHNOLOGY COMMISSION: H. R. 10679 (Karth) introduced in House Aug. 25, 1965, for the

establishment of a Commission on Science and Technology; to Committee on Science and Astronautics.

**SHRIMP IMPORTS:** Rep. Thompson in Congressional Record (p. 19174) Aug. 10, 1965, inserted remarks of a fishery businessman at the Annual Meeting of the Shrimp Association of the Americas, Miami Beach, Fla., June 21, 1965. The businessman refers to the problem of marketing an ever-increasing supply of imported shrimp coming into the United States from 66 nations. He also pointed out that the United States and Mexican shrimp producers propose a solution to the marketing problem--an industrywide advertising program which would include foreign producers, importers, and domestic producers. Accordingly, the International Shrimp Council has been organized to gather funds from producers throughout the world on a sustained basis and to apply the funds to a substantial and well-conceived advertising program that will expand the market and increase consumption of shrimp from year to year. Included is a table showing U. S. imports of shrimp for various years, 1940-64.

**STATE DEPARTMENT APPROPRIATIONS FY 1966:** Subcommittee of Senate Committee on Appropriations, Aug. 9, 1965, in executive session, marked up and approved for full committee consideration H. R. 8639, fiscal 1966 appropriations for the Departments of State, Justice, and Commerce, the Judiciary, and related agencies. Included under the State Department are funds for United States participation in various International Fisheries Commissions.

Senate Committee on Appropriations Aug. 10, 1965, ordered favorably reported with amendments H. R. 8639. The same day the Committee reported (S. Rept. 547) the bill to the Senate.

S. Rept. 547, Departments of State, Justice, and Commerce, the Judiciary, and Related Agencies Appropriation Bill, 1966 (Aug. 10, 1965, report from the Committee on Appropriations, U. S. Senate, 89th Congress, 1st session, to accompany H. R. 8639), 23 pp., printed. Committee reported favorably with various amendments. The Senate-passed bill would appropriate \$2,300,000 for the International Fisheries Commissions, restoring the \$275,000 cut by the House from the Department's budget request.

Bill passed Senate, amended, Aug. 12, 1965. Senate asked for a conference on same day.

House Aug. 16, 1965, disagreed to Senate amendments to H. R. 8639, agreed to conference requested by the Senate, and appointed conferees.

House and Senate conferees met Aug. 18, 1965, and conference report (H. Rept. 807) was filed the same day. Compromise as adopted by conferees appropriates \$2,125,000 for the International Fisheries Commissions, an increase of \$100,000 over the amount approved by the House, but \$175,000 less than the Department's budget request of \$2.3 million which had been approved by Senate.

House Aug. 19, 1965, called up, considered, and adopted conference report (H. Rept. 807) on H. R. 8639 (sent to the Senate by a voice vote). Senate Aug. 24, 1965, adopted conference report on H. R. 8639. These actions cleared bill for President's signature.

H. R. 8639 was signed by the President Sept. 2, 1965 (P. L. 89-164).

**TILLAMOOK BAY AND BAR, OREGON:** S. Doc. 43, Letter from the Secretary of the Army, transmitting a letter from the Chief of Engineers, Department of the Army, Dated June 2, 1965, Submitting a Report, Together with Accompanying Papers and Illustrations, on a Review of the Reports on Tillamook Bay and Bar, Oregon, requested by a Resolution of the Committee on Public Works, United States, Senate, Adopted Aug. 3, 1959; referred to Committee on Public Works, U. S. Senate, 89th Congress, 1st session, July 22, 1965, 143 pp., illus., printed. Contains favorable report from the Army Chief of Engineers, on a review of the reports on Tillamook Bay and Bar, Oregon. Besides the report of the district engineer (giving authority, description, estimate of annual charges, estimate of benefits), it contains comments from various Federal Agencies, State of Oregon, and reports from Chief of Engineers for Rivers and Harbors. One section of the report deals with fishing industry and commercial fishing activity. Several appendixes appear, including jetty design and cost estimate, benefits, correspondence and exhibits.

**TRADE AGREEMENT DUTY REDUCTION:** S. 2403 (Javits) introduced in Senate Aug. 12, 1965, to authorize the President, in carrying out trade agreements with fully developed countries or areas, to reduce duties below the limitation set forth in section 201 (b) (1) of the Trade Expansion Act of 1962, and for other purposes; to Committee on Finance.

**TRADE EXPANSION ACT AMENDMENT:** Introduced in House, H. R. 10293 (Ashbrook) and H. R. 10295 (Collier) Aug. 5, 1965; H. R. 10475 (Bray) Aug. 16, to amend the Trade Expansion Act of 1962; to Committee on Ways and Means.

Rep. Reid in Congressional Record, Aug. 5, 1965 (pp. 18782-18783) pointed out that the Kennedy round should be modified now by legislation while there is yet time, to keep the tariff cuts within the bounds of reason; our industries need a clear outlook into the future as far as this can be achieved. H. R. 10237 introduced Aug. 3, would remove items that can qualify under one or more of the criteria from the Kennedy round (that is, the President's list for a 50-percent tariff reduction); provide for establishment of import quotas if a product met the criteria laid down (such quotas would hold imports at the average level of the past 3 years but would permit annual increases thereafter in the same proportion as the increase in domestic consumption); represent an equitable sharing of the market.

**TRAWLERS FROM POLAND:** Sen. Brewster in Congressional Record (pp. 18824-18825) Aug. 5, 1965, discussed the proposal of the Department of the Interior to purchase two modern fishing trawlers from Poland.

Subcommittee on Merchant Marine and Fisheries of Senate Committee on Commerce, Aug. 11, 1965, held hearings on proposed construction of two stern ramp fishing trawlers in Poland with counterpart funds for operation in American waters.

**TORT CLAIMS AGAINST U. S. BY COMMERCIAL FISHING VESSELS:** H. R. 10308 (Tupper) introduced in House Aug. 5, 1965, to amend the tort claims procedure of title 28, United States Code, to permit actions for damages against the United States by or on behalf of officers and crews of American commercial fishing vessels who are injured or killed at sea by an instrumentality of war; to Committee on the Judiciary.

**VESSEL MEASUREMENT:** Subcommittee on Merchant Marine and Fisheries of Senate Committee on Commerce held hearings Aug. 6, 1965, on S. 2142, to simplify the admeasurement of small vessels. Senate Committee Sept. 2, 1965, reported (S. Rept. No. 677) on S. 2142.

Senate Sept. 8, 1965, passed bill with amendment and cleared it for House.

House Sept. 9, 1965, referred Senate-passed S. 2142 to Committee on Merchant Marine and Fisheries.

**WATER POLLUTION CONTROL ADMINISTRATION:** S. 2481 (Ribicoff) introduced in Senate Aug. 31, 1965, to amend the Federal Water Pollution Control Act, as amended, to increase the share of Federal financial

assistance for construction of municipal sewage treatment works and to authorize increased appropriations for the purpose of making such grants, and for other purposes; to Committee on Public Works.

**WATER RESOURCES PLANNING ACT AMENDMENT:** S. 2445 (Javits) introduced in Senate Aug. 24, 1965, to amend the Water Resources Planning Act to accelerate and increase financial assistance to the States for such planning; to Committee on Interior and Insular Affairs. Sen. Javits in Congressional Record (pp. 20659-20660), Aug. 24, 1965, spoke from the floor of the Senate and stated that this legislation would amend the Water Resources Planning Act of 1965 (Public Law 89-80) by making the grants program effective immediately and by doubling the amount of funds authorized.



### SHRIMP-STUFFED MUSHROOM APPETIZERS

Appetizers should stimulate the appetite for the foods to follow. Appetizers should be choice morsels, prepared and served with care, for the first course is the indicator of things to come. Shrimp are America's most popular appetizer. But shrimp deserve a delicate sauce which heightens, not masks, their delicate flavor. A true connoisseur might prepare a shrimp appetizer in the manner described below--baked shrimp-stuffed mushroom caps, topped with whole shrimp, served with a delicate Mornay Sauce.

#### SHRIMP-STUFFED MUSHROOMS

- |   |  |
|---|--|
| 1-1/2 pounds shelled and deveined small shrimp, fresh or frozen | 1 tablespoon lemon juice                   |
| 16 large mushroom caps  | 1 tablespoon grated onion                  |
| 1 egg, beaten   | 1 tablespoon chopped parsley               |
| 2 tablespoons milk  | Salt and pepper                            |
| 1/4 cup dry bread crumbs  | Melted butter or margarine (about 1/4 cup) |

Cook shrimp in boiling salted water to cover. Drain, then chill. Wash mushrooms and remove stems. Trim ends from mushroom stems and chop. Chop shrimp, reserving 16 whole shrimp for garnishing. Combine chopped shrimp, chopped mushroom stems, bread crumbs, egg, milk, lemon juice, onion, and parsley. Season to taste with salt and pepper. Spoon into hollows of mushroom caps. Top each mushroom cap with a reserved whole shrimp. Brush liberally with melted butter or margarine. Arrange in greased baking pan and bake in moderate oven (375 degrees) for 15 minutes or until mushrooms are tender. Serve with Mornay Sauce. Makes 4 main-dish servings; 8 appetizer servings.

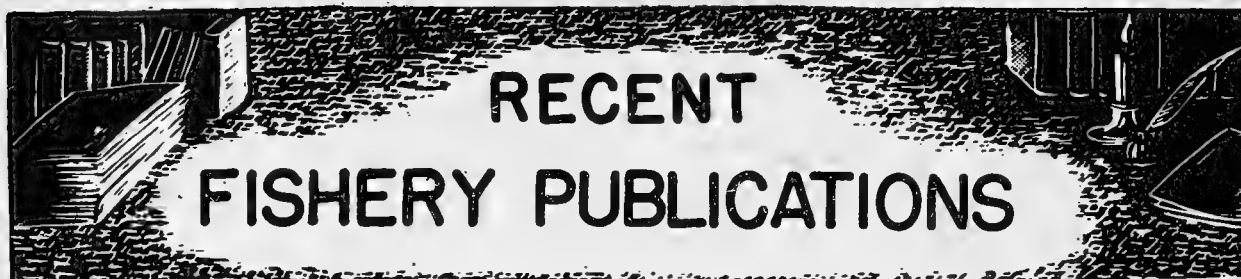
#### MORNAY SAUCE

- |                                  |                               |
|----------------------------------|-------------------------------|
| 1 tablespoon butter or margarine | Dash onion salt               |
| 1 tablespoon flour               | 1/4 cup grated Cheddar cheese |
| 1 cup milk                       | Salt                          |
|                                  | Cayenne pepper                |

cayenne pepper. Heat 1 minute longer. Makes 1 1/4 cups sauce. (J. Walter Thompson Company and Shrimp Association of the Americas.)



Shrimp-stuffed mushrooms with Mornay Sauce



## FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON, D. C. 20240. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.  
FL - FISHERY LEAFLETS.  
MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.  
SEP - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.  
SL - STATISTICAL LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.

- | Number   | Title  |
|----------|--|
| CFS-3772 | - Frozen Fishery Products, 1964 Annual Summary, 14 pp.                 |
| CFS-3789 | - Fish Meal and Oil, 1964 Annual Summary, 4 pp.                        |
| CFS-3810 | - Fish Sticks, Portions, and Breaded Shrimp, January-March 1965, 3 pp. |
| CFS-3816 | - Virginia Landings, 1964 Annual Summary, 11 pp.                       |
| CFS-3818 | - North Carolina Landings, 1964 Annual Summary, 10 pp.                 |
| CFS-3821 | - Alabama Landings, 1964 Annual Summary, 6 pp.                         |
| CFS-3824 | - Texas Landings, March 1965, 2 pp.                                    |
| CFS-3826 | - Mississippi Landings, 1964 Annual Summary, 7 pp.                     |
| CFS-3828 | - Frozen Fishery Products, May 1965, 8 pp.                             |
| CFS-3830 | - Alabama Landings, January 1965, 2 pp.                                |
| CFS-3831 | - Mississippi Landings, January 1965, 2 pp.                            |
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| CFS-3834 | - New Jersey Landings, March 1965, 3 pp.                               |
| CFS-3835 | - New Jersey Landings, April 1965, 3 pp.                               |
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| CFS-3837 | - Alabama Landings, February 1965, 3 pp.                               |
| CFS-3838 | - Georgia Landings, February 1965, 2 pp.                               |
| CFS-3839 | - Mississippi Landings, February 1965, 2 pp.                           |
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| CFS-3841 | - North Carolina Landings, May 1965, 4 pp.                             |
| CFS-3842 | - Louisiana Landings, March 1965, 3 pp.                                |
| CFS-3843 | - Louisiana Landings, April 1965, 3 pp.                                |
| CFS-3844 | - Alabama Landings, March 1965, 3 pp.                                  |
| CFS-3845 | - Mississippi Landings, March 1965, 2 pp.                              |
| CFS-3846 | - South Carolina Landings, March 1965, 2 pp.                           |
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| CFS-3850 | - Georgia Landings, April 1965, 2 pp.                                  |
| CFS-3851 | - South Carolina Landings, April 1965, 2 pp.                           |

- CFS-3852 - Michigan, Ohio & Wisconsin Landings, 1964 Annual Summary, 5 pp.  
CFS-3853 - Michigan, Ohio & Wisconsin Landings, January 1965, 3 pp.  
CFS-3854 - Michigan, Ohio & Wisconsin Landings, February 1965, 3 pp.  
CFS-3856 - Florida Landings, May 1965, 8 pp.  
CFS-3857 - Maine Landings, April 1965, 4 pp.  
CFS-3858 - Fish Meal and Oil, May 1965, 2 pp.  
CFS-3859 - South Carolina Landings, May 1965, 2 pp.  
CFS-3861 - Georgia Landings, May 1965, 2 pp.  
CFS-3862 - Rhode Island Landings, February 1965, 3 pp.  
CFS-3863 - Alabama Landings, May 1965, 3 pp.  
CFS-3864 - Shrimp Landings, January 1965, 5 pp.  
CFS-3868 - Maryland Landings, March 1965, 3 pp.  
CFS-3870 - Middle Atlantic Fisheries, 1964 Annual Summary, 8 pp.  
CFS-3875 - Maine Landings, May 1965, 4 pp.

### Wholesale Dealers in Fishery Products (Revised):

- SL- 2 - New Hampshire, 1964, 1 p.  
SL- 3 - Massachusetts, 1964, 11 pp.  
SL- 4 - Rhode Island, 1964, 2 pp.  
SL- 5 - Connecticut, 1964, 1 p.  
SL- 6 - New York Coastal Area, 1964, 10 pp.  
SL- 7 - New Jersey, 1964, 4 pp.  
SL- 8 - Pennsylvania, 1964, 3 pp.  
SL- 9 - Delaware, 1964, 1 p.  
SL- 11 - Washington, D. C., 1964, 1 p.  
SL- 21 - California, 1964, 9 pp.  
SL- 29 - Ohio (Great Lakes Area), 1964, 2 pp.  
SL- 30 - Pennsylvania (Great Lakes Area), 1964, 1 p.  
SL- 31 - New York (Great Lakes Area), 1964, 2 pp.  
SL- 33 - North Dakota (Mississippi River and Tributaries), 1964, 1 p.  
SL- 39 - Tennessee (Mississippi River and Tributaries), 1964, 2 pp.  
SL- 40 - Oklahoma (Mississippi River and Tributaries), 1964, 1 p.  
SL- 43 - Alabama (Mississippi River and Tributaries), 1964, 1 p.  
SL- 44 - Nebraska (Mississippi River and Tributaries), 1964, 1 p.  
SL- 45 - Mississippi (Mississippi River and Tributaries), 1964, 1 p.  
SL- 46 - Texas (Mississippi River and Tributaries), 1964, 2 pp.  
SL- 49 - South Dakota (Mississippi River and Tributaries), 1964, 1 p.  
SL-151 - Firms Manufacturing Marine Animal Scrap, Meal, Oil, Solubles and Homogenized Condensed Fish, 1963 (Revised), 8 pp.  
SL-161 - Producers of Packaged Fish, 1963 (Revised), 8 pp.



Sep. No. 741 - Bottom Trawling Surveys of the North-eastern Gulf of Alaska (Summer and Fall of 1961 and Spring of 1962).

FL-577 - Haul Seining in the Great Lakes, by William G. Gordon, 18 pp., illus., May 1965. Presents methods of construction and operation that are practical in the present haul seine fishery of the Great Lakes. Covers materials used and details of construction of seines, care and treatment of them, seining equipment, and fishing grounds and procedures. Illustrative diagrams and photographs aid in easy understanding.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BUREAU OF COMMERCIAL FISHERIES, RM. 510, 1815 N. FORT MYER DR., ARLINGTON, VA. 22209.

Number	Title
MNL-11	Fishing Industry in Spain, 1964, 7 pp.
MNL-22	(Supplement) Republic of South Africa and South West Africa Fisheries, 1964, 12 pp.
MNL-38	Developing the Costa Rican Fish Industry, 14 pp.
MNL-44	Iceland's Fishing Industry, 1964, 30 pp.
MNL-48	Pakistan's Fisheries Statistical Report, 1964, 20 pp.
MNL-75	Argentina's Fishing Industry, 1964, 8 pp.
MNL-81	France's Fishing Industry, 1964, 12 pp.

THE FOLLOWING REPRINTS FROM FISHERY BULLETIN, VOL. 63, NO. 3, 1964, ARE AVAILABLE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON, D. C. 20240.

Age, Growth, Sex Ratio, and Maturity of the Whitefish in Central Green Bay and Adjacent Waters of Lake Michigan, by Donald Mraz, pp. 619-634, illus.,

Annotated Bibliography on Biology of Menhaden and Menhadenlike Fishes of the World, pp. 531-549.

A Critical Study of Pribilof Fur Seal Population Estimates, pp. 657-669.

Feeding and Growth of Juvenile Softshell Clams, MYA ARENARIA, pp. 635-642, illus.

Life History of Lake Herring in Lake Superior, pp. 493-530.

Meristic Variation in the Hexagrammid Fishes, pp. 589-609, illus.,

A Method of Measuring Mortality of Pink Salmon Eggs and Larvae, pp. 575-588, illus.

Movements, Growth and Rate of Recapture of Whitefish Tagged in the Apostle Islands Area of Lake Superior, pp. 611-618.

Ocean Mortality and Maturity Schedules of Karluk River Sockeye Salmon and Some Comparisons of Marine Growth and Mortality Rates, pp. 551-574, illus.

AVAILABLE FROM THE BRANCH OF REPORTS, U. S. BUREAU OF COMMERCIAL FISHERIES, 2725 MONTLAKE BLVD. E., SEATTLE, WASH. 98102.

FOLLOWING REPRINTS FROM FISHERY INDUSTRIAL RESEARCH, VOL. 2, NO. 3, 1964.:

Cholesterol Content of Various Species of Shellfish. I--Method of Analysis and Preliminary Survey of Variables, by Mary H. Thompson, pp. 11-15.

Comparison of Chemical and Sensory Tests for Assessing Storage Life of Iced Calico Scallops (PECTEN GIBBUS), by Melvin E. Waters, pp. 5-10.

Comparison of the Picric Acid Turbidity and Nessler Tests with Subjective Evaluations of Quality of Shrimp, pp. 53-56.

Economic Study of Sea Scallop Production in the United States and Canada, pp. 57-79.

Evaluation of the Micro-Diffusion Method for the Determination of Tertiary Volatile Base in Marine Products, by John Spinelli, pp. 17-19.

Free Liquid Content of Gulf Oysters and Suggested Change in Standards, by Arthur F. Novak, E. A. Fieger, and J. A. Liuzzo, p. 3.

Observations of the "Blueing" of King Crab, PARALITHODES CAMTSCHATICA, pp. 47-52.

Preparation of Chilled Meat from Atlantic Blue Crab, by David H. B. Ulmer, Jr., pp. 21-45.

FOLLOWING REPRINTS FROM FISHERY INDUSTRIAL RESEARCH, VOL. 2, NO. 4, MAY 1965.:

Drip Formation in Fish. 3--Composition of Drip from Defrosted Pacific Cod Fillets, by David Miyauchi, John Spinelli, and John A. Dassow, 6 pp.

Economic Aspects of the U. S. Albacore Fishing Industry, by E. A. Hale and D. B. Ferrel, 39 pp.

Frozen King Crab (PARALITHODES CAMTSCHATICA) Meat: Effect of Processing Conditions on Fluids Freed upon Thawing, by Jeff Collins and Russel L. Brown, 9 pp., illus.,

Technological Investigations of Pond-Reared Fish. 2--Extension of the Shelf Life of Buffalo Fish Products Through Use of Antioxidants, 4 pp., illus., printed, April 1965.

Thiaminase Activity in Fish: An Improved Assay Method, by R. H. Gnaedinger, 5 pp., illus.,

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, June 1965, 15 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif. 90731.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; prices for fish meal, oil, and solubles; for the month indicated.

California Fishery Market News Monthly Summary, Part II - Fishing Information, June and July 1965, 10 and 12 pp., respectively, illus. (U. S. Bureau of Commercial Fisheries, Tuna Resources Laboratory, P. O. Box 271, La Jolla, Calif. 92038.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the months indicated.

(Chicago) Monthly Summary of Chicago's Wholesale Market Fresh and Frozen Fishery Products Receipts, Prices, and Trends, May and June 1965, 15 pp. each. (Market News Service, U. S. Fish and Wildlife Service, U. S. Customs House, 610 S. Canal St., Rm. 704, Chicago, Ill. 60607.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and weekly wholesale prices for fresh and frozen fishery products; for the months indicated.

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, June 1965, 11 pp. (Market News Service, U. S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans, La. 70130.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; Gulf menhaden landings and production of meal, oil, and solubles; fishery imports at Mobile, Ala., Morgan City and New Orleans, La., Miami, Fla., and Houston, Port Isabel, and Brownsville, Tex.; and sponge sales; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, June and July 1965, 4 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va. 23369.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City, together with cumulative and comparative data on fishery products and shrimp production; for the months indicated.

New England Fisheries--Monthly Summary, May 1965, 22 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston, Mass. 02210.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial-fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, and Provincetown), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the month indicated.

New York City's Wholesale Fishery Trade--Monthly Summary--April and May 1965, 19 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 346 Broadway, New York, N. Y. 10013.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the months indicated.

Oceanographic Observations, 1962, East Coast of the United States, by Joseph Chase, Data Report 9, 3 microfiche cards, illus., Aug. 1965, distribution

limited. (Branch of Reports, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington, D. C. 20240.)

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, June and July 1965, 9 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl vessels reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the months indicated.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. 20402.

"Effect of temperature on the development of salmon eggs," by Bobby D. Combs, article, The Progressive Fish-Culturist, vol. 27, no. 3, July 1965, pp. 134-137, processed, single copy 25 cents.

This is a Salmon Hatchery, Circular 25, 7 p., illus., printed, revised 1963, 5 cents.

## MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

### ACCLIMATIZATION:

Transplantation of Fish and Aquatic Invertebrates in 1962, U.S.S.R., by A. F. Karpevich and I. Ye. Lokshina, Technical Translation No. 65-30833, 27 pp., printed, April 27, 1965, \$2. (Translated from the Russian, Voprosy Ikhtologii, vol. 5, no. 1, 1965.) Clearinghouse for Federal Scientific and Technical Information, U. S. Department of Commerce, Port Royal and Braddock Rds., Springfield, Va., 22151.

### AMINO ACIDS:

"The composition of essential and certain nonessential amino acids in selected Hawaii fish," by Felicitas S. Cabbat and Bluebell R. Standal, article, Journal of Food Science, vol. 30, no. 1, 1965, pp. 172-177, printed. Institute of Food Technologists, 510-522 No. Hickory St., Champaign, Ill. 61823.

### ANTARCTIC RESEARCH:

Biology of the Antarctic Seas II, Antarctic Research Series, vol. 5, 265 pp., illus., printed, August 1965, \$12.00. American Geophysical Union, 1145 19th St., NW., Washington, D. C. 20036. Among other chapters includes "Oceanographic Investigations in McMurdo Sound, Antarctica"; and "Studies of the Midwater Fishes of the Peru-Chile Trench."

### AUSTRALIA:

Australian Journal of Marine and Freshwater Research, vol. 16, no. 1, April 1965, 131 pp., illus., printed, single copy 10s. (about US\$1.40). Editorial and Pub-

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lications Section, CSIRO, Sixth Floor, 372 Albert St., East Melbourne, C2, Australia. Contains the following articles: "Studies on the physiology of a shrimp, *Metapenaeus* sp. (Crustacea: Decapoda: Penaeidae). II--Endocrines and control of moulting; and III--Composition and structure of the integument"; by W. Dall. Also, "Southern bluefin tuna populations in south-west Australia," by J. S. Hynd; and "Dynamics of two populations of the humpback whale, *Megaptera novaeangliae* (Borowski)," by R. G. Chittleborough.

Current Research on Australian Fishes, by G. L. Ke-steven, Collected Reprint 558, 9 pp., illus., printed. (Reprinted from Proceedings of Australian Society of Animal Production, vol. 5, Aug. 1964, pp. 312-320.) Division of Fisheries and Oceanography, Commonwealth Scientific and Industrial Research Organization, Cronulla, N.S.W., Australia.

#### CANADA:

The Canadian Fish Culturist, Issue 34, May 1965, 39 pp., illus., printed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada. Some of the articles are: "The effect of a marine seismic exploration on fish populations in British Columbia coastal waters," by Roger K. Kearns and Forbes C. Boyd; and "A device for injecting juvenile fish into a pressure conduit," by P. Ryan.

#### CANNING:

"Heat adhesion of fish meat to tin-plate," by Toyoo Takashi and Teruko Tanaka, article, Chemical Abstracts, vol. 62, April 12, 1965, Abstract No. 9695e, printed, American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

#### CATFISH:

"Feeding channel catfish," by C. W. Deyoe, O. W. Tiemeier and S. Wearden, article, Feedstuffs, vol. 37, Jan. 2, 1965, pp. 53-54, printed, Miller Publishing Co., 2501 Wayzata Blvd., Minneapolis, Minn.

#### CAVIAR:

"Alguns aspectos da preparação de caviar" (Some aspects of caviar preparation), by A. Torres Botelho, article, Conservas de Peixe, vol. 20, no. 230, May 1965, pp. 29, 32, printed in Portuguese, Sociedade de Revista Conservas de Peixe, Lda., Regueira dos Anjos, 68, Lisbon, Portugal.

#### CEYLON:

Bulletin of the Fisheries Research Station, Ceylon, vol. 17, no. 2, Dec. 1964, 160 pp., illus., printed, single copy Rs. 5.00 (about US\$1). The Fisheries Research Station, P. O. Box 531, Colombo, Ceylon. Some of the articles are: "A guide to the fresh-water fauna of Ceylon, supplement 2," by C. H. Fernando; "Predation of tuna long-line catches in the Indian Ocean by killer-whales and sharks," by K. Sivasubramaniam; "Pearl oyster survey, Gulf of Manaar, 1964," by C. H. Fernando; "Gill damage in netted *Tilapia mossambica* Peters," by C. H. Fernando and M. T. T. Fernando; "Hatching and rearing of carp in the Polonnaruwa Nursery," by H. H. A. Indrasena and W. B. Ellepola; and "The development of Ceylon's fisheries: a symposium."

#### CHARTS:

Charting Rough Ground and Wrecks, Research Development Bulletin No. 5, 2 pp., processed, Nov.

1964. White Fish Authority, Lincoln's Inn Chambers, 2/3 Cursitor St., London EC4, England.

#### CHESAPEAKE BAY:

Atlas of the Distribution of Dissolved Oxygen and pH in Chesapeake Bay 1949-61, by R. I. Hires, E. D. Stroup, and R. C. Seitz, Graphical Summary Report No. 3, Reference 63-4, 417 pp., illus., processed, Dec. 1963. Chesapeake Bay Institute, The Johns Hopkins University, Baltimore, Md.

#### CHILLING:

Superchilling, Research Development Bulletin No. 2, 4 pp., processed, Sept. 1964. White Fish Authority, Lincoln's Inn Chambers, 2/3 Cursitor St., London EC4, England.

#### CLAMS:

"Salinity, temperature, and food requirements of soft shell clam larvae in laboratory culture," by Alden P. Stickney, article, Ecology, vol. 45, no. 2, Spring 1964, pp. 283-291, illus., printed. Ecology, Ecological Society of America, Duke University Press, Box 6697, College Station, Durham, N. C.

Soft Clam Depuration Studies. Chapter I--Design and Operation of a Cleansing Plant, by Bradford Sterl, Paul J. DeRocher and John W. Hurst; Chapter II--Laboratory Studies on Shellfish Purification, by Philip L. Goggins, John W. Hurst and Peter B. Mooney, 37 pp., illus., processed, September 1964. Maine Department of Sea and Shore Fisheries, Augusta, Me.

Reprints from Proceedings of the National Shellfish Association, vol. 53, 1962. Oceanographic Institute, The Florida State University, Tallahassee, Fla. 32306:

Experimental Farming of Hard Clams, MERCENARIA MERCENARIA, in Florida, by R. W. Menzel and H. W. Sims, Contribution No. 202, processed.

Seasonal Growth of Northern and Southern Quahogs, MERCENARIA MERCENARIA and M. CAMPECHENSIS, and Their Hybrids in Florida, by R. W. Menzel, Contribution No. 201, processed.

#### COD:

"Future of Greenland cod in doubt," article, The Fishing News, no. 2714, June 11, 1965, pp. 11; 13, illus., printed, single copy 9d. (about US\$0.10). Arthur J. Heighway Publications, Ltd., Ludgate House, 110 Fleet Street, London EC4, England.

#### COD AND HADDOCK:

Causes of Seasonal and Annual Variations in the Density of Cod and Haddock Schools in the Barents Sea, by M. M. Kamshilov, N. V. Mironova and O. F. Kondratsova, OTS-63-11112, 5 pp., printed, 1964, 50 cents. (Translated from the Russian, Trudy Soveshchaniy Iktologicheskoi Komissii Akademii Nauk SSSR, no. 10, 1960, pp. 117-121.) Clearinghouse for Federal Scientific and Technical Information, U. S. Department of Commerce, Port Royal and Braddock Rds., Springfield, Va. 22151.

#### COMMERCIAL FISHING:

The First Book of Commercial Fishing, by C. W. Harrison, 80 pp., illus., printed, 1964, \$2.65. Franklin Watts, Inc., 575 Lexington Ave., New York, N. Y. 10022. A compact exposition of many aspects of the

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United States commercial fishing industry. The first few sections give general information on fishing for profits; what happens to the fish we do not eat; fisheries, a vital natural reserve; and the fisherman's watery world. The next several sections cover details of fishing--boats and gear; finding the fish; making the catch; whales, crustaceans, and molluscs; and harvesting the sea's forests. Finally, the author explains about the more than 30,000 species of finfish and many thousands of species of aquatic mammals, crustaceans, and molluscs (illustrated with nearly 200 drawings); fisheries and fishing ports; importance of conservation; and fish for the future. The author emphasizes the need for fishery conservation and management thus: "In one of his State of the Union messages, the late President John F. Kennedy said that in order to meet the nutritional needs of America's swiftly growing population it would be necessary during the next 20 years for commercial fishermen to increase their annual catch of fish and shellfish by 3 billion pounds--an increase of 60 percent over present levels." A short index and a glossary of fishing terms complete this book. Although intended primarily for students, the book should be interesting to the general reader. It is well illustrated with numerous photographs.

#### COMPOSITION:

"Sodium, potassium, and magnesium concentration and weight changes in fish stored in refrigerated sea-water in relation to biochemical changes associated with rigor mortis," by N. Tomlinson, S. E. Geiger, and W. W. Kay, article, Journal of Food Science, vol. 30, no. 1, 1965, pp. 126-134, printed. Institute of Food Technologists, 510-522 No. Hickory St., Champaign, Ill. 61823.

#### CRABS:

Report on Preliminary Studies on the Blue Crab in Alligator Harbor and Adjacent Gulf of Mexico with Some Observations on Stone Crab Larvae, by R. W. Menzel, processed, 1964. Oceanographic Institute, The Florida State University, Tallahassee, Fla. 32306.

#### DENMARK:

Foreign Trade Regulations of Denmark, by William Nagel, OBR 65-32, 8 pp., printed, June 1965, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

#### DOLPHIN:

"The dolphins: 'Like an arrow they fly through the sea'," by Emory W. Brown, Jr., article, United States Naval Institute Proceedings, vol. 91, no. 7, July 1965, pp. 42-50, illus., printed, single copy 75 cents. U. S. Naval Institute, Annapolis, Md. 21402.

#### ECHO-SOUNDER:

Echo Sounders of Advanced Design, Research Development Bulletin No. 11, 3 pp., processed, May 1965. White Fish Authority, Lincoln's Inn Chambers, 2/3 Cursitor St., London EC4, England.

#### ENZYMES:

"Enzymes in the body cavity of fish," by G. Siebert and I. Bottke, article, Chemical Abstracts, vol. 60, March 30, 1964, Abstract No. 8377e, printed. Amer-

ican Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

#### EXPORTS:

U. S. Exports--Commodity by Country, 1964 Annual, FT 410, 592 pp., processed, June 1965, single copy \$2.25. Bureau of the Census, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Presents data of United States exports during 1964 by SITC (Standard International Trade Classification) section by SITC group. Commodity detail shown is that of Schedule B (Statistical Classification of Domestic and Foreign Commodities Exported from the United States) arranged within 3-digit groups of the SITC. Includes data on fresh, processed, and preserved fish and shellfish products by country of destination.

#### FISH COOKERY:

Fish 'n' Tips, 15 pp., illus., printed. Fishery Council, 118 South St., New York, N. Y. 10038. Tells of the wide and varied selection of seafood available today and of its value as a supplier of proteins, minerals, and vitamins. Discusses the advantages of fish for salt-free dieters and for those interested in low caloric intake. Points out what to look for in buying fresh fish and shellfish, and how to store them. Suggests methods of cleaning and cooking to insure maximum retention of flavor. Contains instructions for pan frying, broiling, baking, and steaming various types of fish, including time and temperature charts for preparing fish dishes. Special attention is given to the cooking of clams, lobsters, shrimp, oysters, and scallops. Recipe suggestions for those and other species are included, as well as recipes for sauces.

#### FISH CULTURE:

Fish Cultivation, Research Development Bulletin No. 3, 3 pp., processed, Oct. 1964. White Fish Authority, Lincoln's Inn Chambers, 2/3 Cursitor St., London EC4, England.

#### FISHERY RESOURCES:

Trend of Researches and Conservation on Fisheries Resource in the World, by S. J. Holt, 44 pp., illus., printed in Japanese. Japan Fisheries Resource Conservation Association, 6th Floor, Zenkoku Choson Kaikan Bldg., 1-17, Nagata-cho, Chiyoda-ku, Tokyo, Japan.

#### FISH-LIVER OIL:

"Polyunsaturated fatty-acid content of cod-liver oil," by R. R. Perepletchik, Yu. S. Davydova and E. I. Novikova, article, Chemical Abstracts, vol. 59, Dec. 9, 1963, Abstract No. 14206a, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

#### FISH MEAL:

"Potentiometric method for the determination of chloride in fish meal," by N. Sevkovic, D. Veselinovic and N. Stojanovic, article, Chemical Abstracts, vol. 58, April 15, 1963, Abstract No. 8356a, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

Sanitation Guidelines for SALMONELLA Control in Processing Industrial Fishery Products, ARS 91-51, 16 pp., illus., printed, May 1965. Animal Disease

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Eradication Division, Agricultural Research Service, U. S. Department of Agriculture, Hyattsville, Md. 20251. Offers guidelines for operating procedures and product handling methods for fish meal processors that should result in a *Salmonella*-free product. The guidelines contain specifications for fish meal plant buildings, moisture control, workers' hygienic procedures, raw material handling, cleaning and disinfecting, dust control, containers and transportation of processed material, and finally sampling and laboratory examination. *Salmonella* bacteria cause infectious diseases, including Typhoid Fever, in both man and animals.

"Value of fishmeal preserved with formalin for fattening pigs," by F. Dejnek, article, *Roczniki Nauk Rolnych*, vol. 83, 1963, p. 193, printed in Polish. Polska Akademia Nauk, Warsaw, Poland.

#### FISH OILS:

"Gas chromatographic investigations on the components of oil extracted from *Xiphias gladius* (swordfish) head bones," by I. G. Labruto and A. Pastura, article, *Chemical Abstracts*, vol. 60, Feb. 3, 1964, Abstract No. 3208d, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

"Studies on prevention of deterioration in commercial sardine oil," article, *Annual Report of the Central Institute of Fisheries Technology, Ernakulam, India*, 1963-64, p. 31, printed. Pal and Co., Broadway, Ernakulam, India.

#### FISH POISON:

"Fish poisonings: Their diagnosis, pharmacology, and treatment," by Bruce W. Halstead, article, *Clinical Pharmacology and Therapeutics*, vol. 5, no. 5, 1964, pp. 615-627, printed. C. V. Mosby Co., 3207 Washington Bldg., St. Louis, Mo.

#### FISH POPULATIONS:

*Manual of Methods of Fish Population Analysis*, by J. A. Gulland, Flb/T40, 64 pp., illus., processed, April 1964, distribution restricted. Biology Branch, Fisheries Division, Food and Agriculture Organization of the United Nations, Via delle Terme di Caracalla, Rome, Italy.

#### FISH PROTEIN CONCENTRATE:

*Deodorisation of Aquatic Animal Products*, Japanese Patent, March 29, 1961. Tokkyocho (Patent Office), No. 1, Sannen-cho, Kojimachi-ku, Tokyo, Japan. A deodorized fishery product (fish meal), suitable for use as supplementary protein for human beings or as food additives to sausages and ice-cream, is produced by extracting fat from the fish meal with an organic solvent and then carrying through additional chemical procedures.

"Studies on the effect of drying on the nutritive value of fish meals," article, *Annual Report of the Central Institute for Fish Technology, Ernakulam, India*, 1963-64, p. 93, printed. Pal and Co., Broadway, Ernakulam, India.

#### FISH SAUSAGE:

"Manufacturing sausages from frozen yellowtail tuna," by Z. A. Yakovleva and G. S. Khristoferzen, article, *Rybnoe Khoziaistvo*, vol. 40, no. 7, 1964, pp. 69-70,

printed in Russian, single copy 50 Kop. (about US\$0.55). Rybnoe Khoziaistvo, V. Krasnosel'skaia 17, Moscow B-140, U.S.S.R.

#### FISH SILAGE:

"Fish waste for feeding pigs. 3--'Siloryb'-fish silage made from waste of fat fish for fattening pigs; 4--Flakes of potato and fish made with waste of fat fish as feed for fattening pigs," by C. Lewicki, article, *Roczniki Nauk Rolnych*, vol. 83, 1963, pp. 135, 305, printed in Polish. Polska Akademia Nauk, Warsaw, Poland.

#### FOOD:

*Fish as Food. Vol. III--Processing: Part 1*, edited by Georg Borgstrom, 503 pp., illus., printed, 1965, \$17.50. This is the third volume of a four-volume work which reviews the knowledge of marine and fresh-water animals and plants used as food. The basic fields of production, biochemistry, and microbiology were covered in volume I. The second volume presented the "public health" aspects of fish--nutrition, sanitation, handling, and uses. The fourth volume is expected to discuss canning, handling of fresh fish, freezing, and radiation preservation. This volume, which was intended originally to have been the last, covers several types of fish processing--drying and dehydration, smoking, salting (especially herring and cod), marinating, and some others unique to particular regions of the world and to highly industrialized nations. Historically, the processing of fish and shellfish through drying and salting predates the preservation of any other food. The importance to human as well as animal nutrition of appropriately processed fishery products can scarcely be overemphasized. The first chapter of this book covers theoretical and practical aspects of fish drying and dehydration. The physics and chemistry of wood smoke as well as techniques for smoking fish are explained in the next chapter. Following are chapters discussing the salting of herring and cod; manufacturing processes, keeping properties, and chemical and microbiological actions of cold, cooked, and fried marinades; Scandinavian anchovies and herring tidbits and their preparation; processing of the genuine cured anchovy from *Engraulis encrasicolus* Linnaeus. Other chapters explain the preparation of exotic fermented and dried seafood products in Southeast Asia in some detail; whale products as food and fish sausage manufacturing (both almost exclusively Japanese); recently developed concepts and their application to industrial fish processing, especially fish solubles; regional development of fisheries and processing; and fish meal manufacture, properties, and utilization. "Only through wise utilization and efficient processing is it possible to save these extremely perishable riches of the oceans and fresh waters and place them within reach of the consuming public independent of seasons and of fishing fortunes--and mostly far removed from the catching grounds," comments the editor. This volume should be of primary interest to food technologists, but will also be valuable to those in import-export trade, processing (canning, freezing, etc.), marketing, and distribution. (See *Commercial Fisheries Review*, Sept. 1962, p. 132, for review of Volume I; March 1963, p. 106, for review of Volume II.) Anyone wishing to learn more about fish as food should read all three volumes.

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#### FOOD AND AGRICULTURE ORGANIZATION:

General Fisheries Council for the Mediterranean, Eighth Session, FAO/Rome, 10-15 May 1965, Report, 41 pp., processed in French and English, 1965. General Fisheries Council for the Mediterranean, Food and Agriculture Organization of the United Nations, Via delle Terme di Caracalla, Rome, Italy. Contains a summary record of the plenary meetings; program of work, recommendations, and resolutions adopted at the session; a list of participants; and summary record of the technical committees' meetings and review of the implementation of the work program of the 7th Session. Strengthening of the Fisheries Division of FAO was endorsed by the Council.

Intersession Report (1963-1964) of Technical Committee II, Craft and Gear Sub-Committee, Food Technology Sub-Committee and Socio-Economics and Statistics Sub-Committee Submitted to the 11th Session of the IPFC, Occasional Paper 65/2, 127 pp., processed, 1965. Indo-Pacific Fisheries Council, Food and Agriculture Organization of the United Nations, FAO Regional Office for Asia and the Far East, Bangkok, Thailand. An account of the developments in the Member Countries during 1963-64 in the fields of fishing craft, harbors, gear, fishing enterprises, training of boat builders and fishermen, fish handling, processing, distribution, technical assistance programs, and documentation. Also includes information of action taken by member governments as well as by FAO on recommendations made by the Council at its 10th Session, held at Seoul, Republic of Korea, Oct. 10-25, 1962. Member countries are Cambodia, Ceylon, Hong Kong, India, Japan, Korea, Malaysia, Pakistan, Philippines, Thailand, the United States, and Viet Nam.

Yearbook of Fishery Statistics, 1963 (Fishery Commodities), vol. 17, 450 pp., processed in French, Spanish, and English, 1965, \$6.50. Food and Agriculture Organization of the United Nations, Rome, Italy. (Available from Columbia University Press, International Documents Service, 2690 Broadway, New York, N. Y. 10027.) This volume covers disposition of the world's catches and both production and international trade data by types of fishery commodities during 1963. The tables are arranged in 8 sections. The first section consists of 3 subsections showing summaries for: (1) disposition of catch; (2) production of preserved and processed fishery commodities; (3) international trade in fishery products. The remaining 7 sections are devoted to these fishery commodity groups: fresh, chilled, or frozen fish; dried, salted, or smoked fish; fresh, frozen, dried, salted, and otherwise processed crustaceans and molluscs; fish products and preparations, whether or not in airtight containers; crustacean and mollusc products and preparations, whether or not in airtight containers; oils and fats of aquatic animal origin, crude or refined; and meal, solubles, and similar animal feedstuffs of aquatic origin. Each of the 7 sections contains 3 subsections: (1) production of the commodity subgroups, by countries and products; (2) imports and exports of the commodity group, by countries; and (3) exports from principal exporting countries, by commodity subgroups, broken down by national items.

#### FOOD MANAGEMENT:

Available from the Cooperative Extension Service, University of Massachusetts, Amherst, Mass.:

Care and Handling of Prepared Frozen Foods in Food Service Establishments, by A. T. Miller and others, Food Management Leaflet 9, 8 pp., illus., printed, Jan. 1965. Reviews briefly the way that foods react to freezing and frozen storage; discusses the reasons why prepared frozen foods require special care and handling; and suggests measures which will help the food service operator to protect both the quality of his product and the health of his customers.

Purchasing Food for Food Service Establishments, by Charles E. Eshbach and Albert L. Wrisley, Food Management Leaflet 10, 22 pp., illus., printed, April 1965. Good food purchasing can best be described as having the right product at the right place at the right time, and at a price that you wish to pay. It is one of the major activities in the operation of any food service establishment, according to the authors. This leaflet covers the requirement of the food buyer for a variety of knowledge and how to acquire that knowledge--of the needs of the establishment, of the market in which he buys, of the products he must purchase, of the procedures he must use, and of the results (including handling) of his purchases. The operator who maintains a close contact with the desires of his customers is able to adjust to change before his operation is adversely affected, concludes the leaflet.

#### FRANCE:

Bulletin d'Information, no. 19, May 1965, 23 pp., processed in French. Comité Local des Pêches Maritimes de Bayonne, Bayonne, France. Contains, among others, these articles: "La campagne thonière africaine" (African tuna season); "La campagne expérimentale du 'Tutina' dans le Golfe d'Aden" (The exploratory cruise of the "Tutina" in the Gulf of Aden); "L'Organisation de la campagne sardinière" (The organization of the sardine season); and "La campagne de l'anchois" (The anchovy season).

"Le Panorama des pêches françaises" (Panorama of French fisheries), articles, France Pêche, no. 95, May 1965, pp. 52-87, illus., printed in French, single copy 2.50 F. (about US\$0.50). France Pêche, Boite Postale 179, Lorient, France. A complete overview of the French fishing industry in 1964. Contains sections on the Law of the Sea, international fishery conventions, protection of coastal waters, imports and exports, the Common Market, and third countries and the Franc Zone. Also covers at length the development of the French fish market in 1964, its general organization, with special attention to price stability problems. Discusses production difficulties in a complex economy, further exploitation of resources, aid to foreign and domestic fisheries, personnel involved in the fishing industry, and fishery research programs in effect. Finally, conclusions by J. S. Parquic, president of the Central Committee on Maritime Fisheries, are presented. Included is a four-page spread of statistical graphs and tables. Among them: a graph of the value and quantity of French fish production, 1962-64; a graph showing the changes in catches by principal species, 1959-64; a table of values and tonnage of France's Mediterranean catch by port of entry, 1959-



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64, and by species, 1962-64; and a graph of the comparative increase in production of 11 of France's principal ports, 1963-64.

#### FREEZING:

"Continuous mechanical IQF freezer for fillets, sea-foods developed," article, Quick Frozen Foods, vol. 27, no. 9, April 1965, pp. 52-54, illus., printed. E. W. Williams Publications, Inc., 1776 Broadway, New York, N. Y. 10019.

#### FRESH-WATER FISHERIES:

On the Conservation of Fresh-Water Fisheries Resources in the U. S. A., by Y. Yamanaka, K. Yagi, and Y. Tsuchida, Overseas Fishery Series 7, 64 pp., illus., printed in Japanese, March 1965. Japan Fisheries Resource Conservation Association, 6th Floor, Zenkoku Choson Kaikan Bldg., 17-banchi, 1-chome, Nagata-cho, Chiyoda-ku, Tokyo, Japan.

#### FROZEN FISH:

"Novyi sposob defrostatsii ryby" (New method of thawing fish), by I. I. Vedernikov, article, Kholodil'naya Tekhnika, no. 3, 1965, pp. 45-46, illus., printed in Russian, single copy 60 Kop. (about US\$0.65). Four Continent Book Corp., 822 Broadway, New York, N. Y. 10003.

#### GEAR:

"New Brunswick vessel tests new gear," article, Trade News, vol. 17, no. 10, April 1965, pp. 8-9, illus., processed. Information and Educational Service, Department of Fisheries, Ottawa 8, Canada. Reports on the highly successful introduction of the drum hauler to Atlantic provinces. Fishermen are enthusiastic about the gear, especially after experiencing favorable results in the initial Atlantic tests--including good catches in February and April, a speed-up in fishery operations, and the drum hauler's easy installation.

#### GERMAN FEDERAL REPUBLIC:

Available from Bundesforschungsanstalt für Fischerei, Palmallee 9, Hamburg-Altona 2, Federal Republic of Germany.:

Archiv für Fischereiwissenschaft, vol. 15, no. 3, May 1965, 114 pp., illus., printed in German with English abstracts. Some of the articles are: "Observations on the depth range of tagged bluefin tuna (*Thunnus thynnus* L.) based on pressure marks on the Lea tag," by J. Hamre (in English); "Enzyme des aminosäurestoffwechsels in der kabeljau-muskulatur" (Enzymes of amino acid assimilation in the musculature of cod), by G. Siebert, A. Schmitt, and I. Bottke; "Über die bedeutung proteolytischer fermente bei der herstellung nichtsterilisierter fischwaren" (On the significance of proteolytic enzymes in the production of unsterilized fishery products), by V. Meyer; and "Über den quantitativen nachweis von milchsäurebakterien in mariniertem heringsfleisch" (On the quantitative proof of lactic acid bacteria in marinated herring meat), by F. Gehring.

Informationen für die Fischwirtschaft (Information for the Fishing Industry), vol. 12, no. 1, 1965, 40 pp., processed in German. Includes, among others, these articles: "Die erste Suchreise des FFS 'Anton Dohren' im Jahre 1965 (85. Reise)" (The first

research cruise of the FRS "Anton Dohren" in 1965--85th voyage); "Deutsche Fischereientwicklungshilfe für Thailand" (German aid for fisheries development in Thailand); "Internationale Bestimmungen über Mindestmachengrößen und Scheuerschutzvorrichtungen in der Hochseefischerei" (International determination of minimum mesh size and chafing gear standards in the high-seas fisheries); and "Internationaler Fischereifahrzeug-Kongress der FAO vom 23.-29.10.65 in Göteborg" (FAO's International Congress on Fishing Vessels, Oct. 23-29, 1965, in Göteborg).

#### GREAT LAKES:

Economic Aspects of the Great Lakes Fisheries of Ontario, by Harold C. Frick, Fisheries Research Board of Canada Bulletin No. 149, 160 pp., illus., printed, 1965, \$2.50. Queen's Printer and Controller of Stationery, Ottawa, Canada.

#### HERRING:

"Herrings are attracted by electric light," by G. Filimonov, article, Rybnoe Khoziaistvo, vol. 40, no. 8, 1964, pp. 61-62, printed in Russian, single copy 50 Kop. (about US\$0.55). Rybnoe Khoziaistvo, V. Krasnol'skaia 17, Moscow B-140, U.S.S.R.

"Vintersildinnsigene 1965" (Winter herring prospects for 1965), by Finn Devold, article, Fiskets Gang, vol. 51, no. 26, July 1965, pp. 378-380, illus., printed in Norwegian. Fiskets Gang, Fiskeridirektoratet, Radstuplass 10, Bergen, Norway.

Articles from Fiskaren, vol. 42, no. 20, May 19, 1965, printed in Norwegian. Norges Fiskerlag, Postboks 172, Bergen, Norway:

"Vintersildfiskarane kan vente sluttoppgjør i slutten av mai" (Winter herring fishermen can expect final settlement by the end of May), pp. 1, 7.

"Vintersildkvantumet 1965 ble 2.434.408 hl" (Winter herring catch in 1965 is 2,434,408 hectoliters), p. 1.

Articles from Scottish Fisheries Bulletin, no. 23, June 1965. Fisheries Division, Department of Agriculture and Fisheries for Scotland, Edinburgh, Scotland:

"Forecast for Scottish North Sea and west coast herring fisheries in 1965," by B. B. Parrish and A. Saville, pp. 3-5.

"Herring trawling off the west coast of Scotland," by I. G. Boxter, pp. 23-25, illus.

#### ICE:

Which Kind of Ice is Best? by J. J. Waterman, Torry Advisory Note No. 21, 9 pp., printed, March 1965. Torry Research Station, Ministry of Technology, P. O. Box 31, Aberdeen, Scotland.

#### INDIA:

Annual Report of the Department of Fisheries, Maharashtra State, Bombay, for the Year 1962-63, 58 pp., illus., printed, July 1, 1963. Department of Fisheries, Government of Maharashtra, Taraporevala Aquarium, Netaji Subhas Rd., Bombay-2, India. Reviews the progress achieved by the fishing industry, difficulties met and overcome, and projects continued or begun by the Maharashtra State Government for development of the fisheries during the year, July 1, 1962-

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June 30, 1963. Includes information on the marine fisheries; provisions for the fishing industry contained in the Third Five Year Plan; financial assistance to the fish trade; preservation, transport, and marketing; and fish-curing yards. Also discusses the Taraporevala Aquarium and research, fisheries schools and training, cooperatives and socio-economic development, fresh-water fisheries, and technological projects. Contains statistical data on fresh fish shipments into Bombay, 1962/63; trawler landings by month and type of fish; landings by Government of India deep-sea vessels; arrivals of fish at Greater Bombay markets; salt-fish production; and financial statement of shark-liver oil manufacture.

#### INDIAN OCEAN:

"New data on Indian Ocean fishes," by V. V. Nekrasov, article, *Rybnoe Khoziaistvo*, vol. 40, no. 8, 1964, pp. 9-11, printed in Russian, single copy 50 Kop. (about US\$0.55). *Rybnoe Khoziaistvo*, V. Krasnosel'skaia 17, Moscow B-140, U.S.S.R.

#### INTERNATIONAL COMMISSIONS:

(International Pacific Salmon Fisheries Commission) Annual Report 1964, 37 pp., illus., printed, 1965. International Pacific Salmon Fisheries Commission, P. O. Box 1120, New Westminster, B. C., Canada. Explains briefly the origin, history, and purpose of the Commission, and gives a detailed description of its activities in 1964. Discusses the twelve formal meetings of the Commission held in 1964, regulations for fishing in Canadian and United States Convention waters, and emergency amendments promulgated. Reports on the 1964 sockeye fishery: a decline much smaller than predicted, sockeye escapement, and rehabilitation. Analyzes comparative data on numbers of fry per pink salmon spawner from 1961-1964. Discusses the Commission's continued concern for watershed improvement on the salmon rivers, investigation of the problems presented by increased log transport on the rivers, and further construction of fishways and other means of protection.

#### IRRADIATION PRESERVATION:

Radiation Preservation of Foods Program: Proceedings of Contractors' Meeting (8th), U. S. Army Natick Laboratories, Natick, Massachusetts, October 7-9, 1963, edited by Frank R. Fisher and Edward S. Josephson, 196 pp., printed, 1964, \$1.25. U. S. Army Natick Laboratories, Natick, Mass.

Radioactive Isotopes in Soviet Food Industry, FSTC-381-T64-144, 33 pp., printed, March 1965. (Translated from the Russian, *Pishchevaya Promyshlennost' i Sel'skoye Khozyaystvo SSSR*, 1961, pp. 77-101.) U. S. Army Foreign Science Technical Center, Washington, D. C. 20315.

Study of Irradiated-Pasteurized Fishery Products, Oct. 1, 1963-Sept. 30, 1964, by Joseph W. Slavin and Louis J. Ronsivalli, TID-21600, 54 pp., printed, Nov. 30, 1964, \$3. U. S. Atomic Energy Commission, Washington, D. C. (For sale by the Clearinghouse for Federal Scientific and Technical Information, U. S. Department of Commerce, Port Royal and Braddock Rds., Springfield, Va. 22151.)

#### JAPAN:

Marine Fisheries Catches for 1964 (Preliminary), 14 pp., illus., printed in Japanese, 1965. Statistical Research Division, Ministry of Agriculture and Forestry, 2-1, Kasumigaseki, Chiyoda-ku, Tokyo, Japan.

"The modern fish finder and its application in Japan," by Y. Tawara, article, *IPFC Current Affairs Bulletin*, no. 42, April 1965, pp. 1-16, illus., printed. Indo-Pacific Fisheries Council, Food and Agriculture Organization of the United Nations, Regional Office for Asia and the Far East, Maliwan Mansion, Phra Atit Rd., Bangkok, Thailand.

Yearbook of Fisheries--1965, No. 12, 608 pp., illus., printed in Japanese, 1,900 yen (about US\$5.28) plus postage. Suisansha, 8 banchi, Sanei-cho, Shinjuku-ku, Tokyo; Japan.

#### LAW OF THE SEA:

"Offshore claims and problems in the North Sea," by Richard Young, article, *American Journal of International Law*, vol. 59, no. 3, July 1965, pp. 505-522, printed, single copy \$3.50. American Journal of International Law, 2223 Massachusetts Ave. NW., Washington, D. C. 20008. Investigation of possibly very large petroleum and natural gas deposits in the continental shelf under the North Sea is now being made. However, for centuries the North Sea has been one of the world's major fishery regions and the avenue to the world's busiest seaports. Thus all three of the principal uses of the seas--fishing, navigation, and the exploitation of mineral resources--are expected to meet for the first time on a large scale in an area where all are of major importance. The diplomatic and legal process of reconciling the various interests will provide the first thoroughgoing test of the adequacy of the principles laid down by the 1958 Geneva Convention on the Continental Shelf. This article reviews some of the geographical and economic factors involved in the North Sea situation, notes some of the technical and legal developments that have already occurred, and considers those elements in the light of the various interests of adjacent countries and legal principles concerned.

#### MACKEREL:

"Minimipriset pa makrill hojt med 5 ore--koparna hade tillstyrkt 15 ores hojning" (The minimum price for mackerel increased by 5 ore--buyers have added on a 15-ore increase), by Ingemar Gerhard, article, *Svenska Vastkustfiskaren*, vol. 35, no. 10, May 25, 1965, pp. 172-173, printed in Swedish. Svenska Vastkustfiskarnas Centralforbund, Ekonomisktottet Postbox 1014, Goteborg 4, Sweden.

#### MARICULTURE:

"Mariculture--its recent development and its future," by Victor L. Loosanoff, article, *Agricultural Engineering*, vol. 46, no. 2, Feb. 1965, pp. 73, 93, 97; printed. American Society of Agricultural Engineers, 505 Pleasant St., St. Joseph, Mich.

#### MARINE AIDS:

Light List, Vol. V--Mississippi River System, 292 pp., illus., printed, 1965, \$1.75. U. S. Coast Guard, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Contains a list of lights, fog sig-

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nals, buoys, and daybeacons for the Mississippi River System of the United States, Second Coast Guard District.

#### NETHERLANDS:

Visserij in Cijfers 1964 (Fisheries in Figures, 1964), Verslagen No. 129, 62 pp., illus., processed in Dutch, May 1965. Landbouw-Economisch Instituut, Conradskade 175, 's-Gravenhage, Netherlands.

#### NORTH AMERICA:

"Future of North American fisheries examined," article, Trade News, vol. 17, no. 11-12, May-June 1965, pp. 10-16, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada.

#### NORWAY:

Articles from Fiskets Gang, vol. 51, 1965, printed in Norwegian. Fiskeridirektoratet, Radstuplass 10, Bergen, Norway:

"Lonnsomheten av fiskefartoyer over 40 fot i 1963" (Profitability of fishing vessels of over 40 feet in 1963), no. 20, May 20, pp. 277-286, illus.

"Rapport til fiskeridirektoren vedrørende leitetjenesten med M/S 'Arne Hovden' pa stor- og varsildfiske og i Nordsjoen in 1965" (Report to the Fishery Department concerning fish-scouting with R/V 'Arne Hovden' in the large- and spring-herring fishery and in the North Sea in 1965), by Vermund Dahl, no. 21, May 27, pp. 310-312.

"Rapport om forsök og veiledningstjeneste i Senjaområdet, Svendsgrunnen og Malanggrunnen, Vesterålsfeltene og yttersiden av Lofoten" (Report on research and exploratory fishing in the Senja region, Svend Ground, Malang Ground, Vesteråls Grounds, and outside Lofoten), by O. Chr. Jenssen, no. 25, June 24, 1965, pp. 361-364.

#### OCEANOGRAPHIC VESSELS:

An Evaluation of Recent Research Vessel Construction in the United States, by John Dermody, Jonathan Leiby and Maxwell Silverman, 18 pp., printed, 1964. Scripps Institution of Oceanography, University of California, La Jolla, Calif.

#### OCEANOGRAPHY:

"Canadian fisheries research extends to Caribbean Sea," by S. N. Tibbo, L. M. Lauzier, and A. C. Kohler, article, Trade News, vol. 17, no. 11-12, May-June 1965, pp. 3-9, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada. Describes in detail an exploratory cruise made by the Canadian oceanographic vessel "Hudson" between St. Andrews, N. B., Cape Hatteras, N. C., and the eastern Caribbean in February 1965. The team of Canadian and American oceanographers and biologists studied the breeding grounds and wintering areas of swordfish and tuna. The program was designed primarily to provide biological information on the distribution, movements, size, food and feeding habits, spawning areas, and seasons of those species, and oceanographic information on the temperature and salinity in which those fish live. Long-lining, plankton tows, and hydrographic observations were the principal activities.

Current Measuring by Towed Electrodes; Observations in the Arctic and North Seas, 1953-59, Fishery Investigations Series, II, vol. 23, no. 8, printed, 1965, 47s. 6d. (US\$9.60 when ordered in the United States). Ministry of Agriculture, Fisheries and Food, London, England. (Available from the British Information Services, 845 Third Ave., New York, N. Y. 10022.)

Development of Buoy-Mounted Oceanographic Sensors (BMOS), by Don J. Cretzler and others, 131 pp., illus., printed, Feb. 15, 1965, \$1. Bisset-Berman Corp., G Street Pier, San Diego, Calif.

F.R.V. "Derwent Hunter," Scientific Reports of Cruises 1950-56, Report 39, 156 pp., illus., processed, 1965. Marine Laboratory, Division of Fisheries and Oceanography, Commonwealth Scientific and Industrial Research Organization, Cronulla, Sydney, Australia.

"The jet net, a new high-speed plankton sampler," by William D. Clarke, article, Journal of Marine Science, vol. 22, no. 3, 1964, pp. 284-287, illus., printed. Sears Foundation for Marine Research, Bingham Oceanographic Laboratory, Yale University, New Haven, Conn.

Oceanographic Cruise USCGC NORTHWIND, Chukchi, East Siberian and Laptev Seas, August-September 1963, Oceanographic Report No. 6, CG 373-6, 75 pp., illus., printed, March 1965. U. S. Coast Guard Oceanographic Unit, Bldg. 159E, Navy Yard Annex, Washington, D. C. 20390.

Available from Compass Publications, Inc., 1111 N. 19th St., Arlington, Va. 22209:

A Glossary of Ocean Science and Undersea Technology Terms, edited by Lee M. Hunt and Donald G. Groves, 180 pp., illus., processed, 1965, \$5.95. "Oceanography is not a science, but rather it is the magnificent combination of all other sciences that are in any way applicable to the watery seven-tenths of our planet," explains the preface. Today, interest in our global sea has reached international proportions and has brought into the field many firms, scientists, engineers, and technicians to whom at least part of the language of oceanography is new. This book is for those people and for any others interested in the sea. It is an alphabetical compilation of terms defined concisely and briefly. It describes the most important words in the basic areas of: oceanography, including physical, biological, chemical, geological, and meteorological; oceanographic instrumentation; underwater sound; ocean engineering; diving physiology; and general terms, including abbreviations and acronyms (i.e. AFS - American Fisheries Society).

"Technical Meetings Draw Record Attendance," by Larry L. Booda and Charles W. Covey, article, Under Sea Technology, vol. 6, no. 7, July 1965, pp. 20-23, 25-35, 43. Ocean engineers, the practical men of the sea, are increasingly active applying to operational systems the wealth of information furnished them by oceanographers and other marine scientists. The entire "ocean fraternity" is now benefiting from discovery. Part of the discovery process is the exchange of information through presentation of technical papers. The first half of 1965 was exceptionally fruitful in technical conferences and symposia, climaxed by the Ocean Science and Ocean Engineering

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Conference and Exhibit in Washington, June 14-17. This article is a digest of the activities and noteworthy papers given at 10 technical sessions held in the United States during that period.

Available from U. S. Naval Oceanographic Office, Washington, D. C. 20390:

Manual for Coding and Key punching Biological Data--Phytoplankton Deck, Primary Productivity Deck, Phytoplankton Pigment Deck, Zooplankton Deck, Benthos Deck, Publication M-4 (Provisional), 125 pp., illus., processed, 1965, \$1.25. This manual provides the necessary instructions and conversion tables for reducing biological and related data collected at biological oceanographic stations to the standard format developed by the National Oceanographic Data Center (NODC). It is intended for use by institutions, agencies, and other contributors interested in furnishing data to NODC for processing; copies of the forms are also available in volume to those who wish to maintain a system compatible with that of the national archive.

Manual for Processing Current Data. Part I--Instructions for Coding and Key punching Drift Bottle Data, Publication M-6 (Provisional), 26 pp., processed, 1965, 40 cents. During the December 1963 meeting of the Committee for the Scientific Exploration of the Atlantic Shelf, a suggestion was made and implemented to set up a storage and retrieval system for drift bottle data at the National Oceanographic Data Center. This provisional publication gives instructions for reporting both reduced release and release-recovery drift bottle data on either the NODC coding form or punch card.

Reference Sources for Oceanographic Station Data. Vol. I; Vol. II, compiled by Carmen Johnson, Publication C-1 in NODC Catalog Series, 185 pp., 146 pp., respectively, processed, 1965, \$2 each. This catalog contains a completely revised and updated collection of the material presented in 1961; it is intended as an index of the National Oceanographic Data Center's station data holdings and of the bibliographic reference from which the existing holdings were obtained. The sources are in numerical order and are printed on card stock which may be cut into 3" x 5" cards for use as a card file. Appendixes contain NODC Reference Cruise Number Index by Country, and List of Final Processed Cruises as of July 1, 1964. Additions to this publication, as well as updating and revision of cards, are scheduled to be made periodically.

#### OYSTERS:

Reprints of articles available from the Virginia Institute of Marine Science, Gloucester Point, Va. 23062:

Neurosecretory Changes in the Nervous System of the Oyster, CRASSOSTREA VIRGINICA, Induced by Various Experimental Conditions, by R. Nagabhushanam, Contribution No. 180, 4 pp., illus., printed. (From the Indian Journal of Experimental Biology, vol. 2, no. 1, 1964, pp. 1-4.)

Preliminary Report on the Cytochemical Study of the Neurosecretory Cells in the Visceral Ganglia of the Oyster, CRASSOSTREA VIRGINICA, by R. Nagab-

hushanam, Contribution No. 174, 3 pp., printed. (From Science and Culture, vol. 29, Oct. 1963, pp. 506-507.)

#### PAKISTAN:

Foreign Trade Regulations of Pakistan, by Jackson B. Hearn, OBR 65-31, 12 pp., printed, May 1965, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

#### PHYSIOLOGY:

"Methods of aging fish provide interesting scientific study," by Wayne E. Swingle, article, Alabama Conservation, vol. 35, no. 2, Feb.-March 1965, pp. 12-15, illus., printed. Alabama Department of Conservation, 64 N. Union St., Montgomery, Ala. 36104.

#### PILCHARD:

"Pilchard fisheries: A study," by M. B. Culley, article, Fishing News International, vol. 4, no. 2, April-June 1965, pp. 183-184, 187-188, illus., printed, single copy 6s. 6d. (about 90 U. S. cents). Arthur J. Heighway Publications Ltd., Ludgate House, 110 Fleet St., London EC4, England. A comparison of the pilchard fisheries of Cornwall, where demand is high and catches are declining; and those of South and South-West Africa, where waters are extremely fertile, but where home demand is comparatively small. The urgent need for Britain to turn its attention to this potentially valuable, now under-exploited resource of the Channel is stressed.

#### POLAND:

"The fisheries of Poland," article, Trade News, vol. 17, no. 11-12, May-June 1965, pp. 21-22, processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada.

Articles from France Pêche, no. 95, May 1965, printed in French, single copy 2.50 F. (about US\$0.50). France Pêche, Boîte Postale 179, Lorient, France:

"L'industrie des pêches polonaises" (The Polish fishing industry), pp. 34-35, illus.

"Le plan d'expansion de la flotte de pêche polonaise" (The plan for expanding the Polish fishing fleet), pp. 36-38, illus.

Available from Maritime Branch, Polish Chamber of Foreign Trade, ul. Pulaskiego 6, Gdynia, Poland:

"Export of fish and fish products in 1964," article, Polish Maritime News, vol. 8, no. 81, May 1965, pp. 31-32, illus., printed.

"Odra' fishery of Swinoujscie"; "'Gryf' deep sea fishery"; "Deep sea fishing bases," article, Polish Maritime News, vol. 8, no. 82, June 1965, pp. 17-20, illus., printed.

Polish Maritime Economy Facts and Figures, edited by Bohdan Sienkiewicz, 160 pp., illus., printed, 1965. Contains sections on Poland's seaborne trade, ports, shipping, and the shipbuilding industry. A section on sea fisheries discusses the history of the Polish industry; organization of the fisheries; and fishery products landings, processing, and foreign trade. In 1936

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(the best of the pre-war years) Polish fishermen landed a total of 23,300 metric tons of salt-water fish, mostly sprats. In 1964, about 244,400 tons of sea fish were landed. A list of addresses includes those for Government agencies concerned with the fishing industry and various fishing companies.

#### POLLOCK:

"Mise en évidence de stéroïdes oestrogènes par chromatoplaque dans l'ovaire salé du colin d'Alaska, *Theragra chalcogramma* Pallas" (Demonstration on colored plates of estrogenic steroids in the salted ovary of the Alaska pollock, *Theragra chalcogramma* Pallas), by Ta-dasi Nomura and Yasuhiko Tsuchiya, article, *The Tohoku Journal of Agricultural Research*, vol. 14, no. 4, March 1964, pp. 307-313, illus., printed in French. Library, Faculty of Agriculture, Tohoku University, Sendai, Japan.

#### POLLUTION:

Pollution-Caused Fish Kills in 1964, Public Health Service Publication No. 847 (revised), 32 pp., illus., printed, 1965, 25 cents. Public Health Service, U. S. Department of Health, Education, and Welfare, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Presents data on pollution-caused fish kills by State, source of pollution, type of water and water body, month, severity of damage, and others; and cumulative listing of fish kills by river or lake affected.

#### POND FISHERIES:

Warm-Water Ponds for Fishing, by W. W. Neely, Verne E. Davison, and Lawrence V. Compton, *Farmers' Bulletin* 2210, 16 pp., illus., printed, May 1965, 10 cents a copy. U. S. Department of Agriculture, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.)

#### POTOMAC RIVER:

Regulations--Potomac River Fisheries Commission for Licensing and Taking of Finfish, Crabs, Oysters, and Soft Shell Clams from the Waters of the Potomac River (effective July 29, 1965), 23 pp., processed, 1965. Potomac River Fisheries Commission, P. O. Drawer 128, Colonial Beach, Va. 22443. Included in these regulations are general instructions pertaining to all fishermen, duties of officers, arrests, and other matters; and those governing licensing of fishermen and gear; the oyster fishery, the oyster inspection tax, and the soft shell clam fishery.

#### PROCESSING MACHINERY:

Articles from *Rybnoe Khoziaistvo*, vol. 40, no. 7, 1964, printed in Russian, single copy 50 Kop. (about US\$0.55). *Rybnoe Khoziaistvo*, V. Krasnosel'skaia 17, Moscow B-140, U.S.S.R.:

"Device for breeding of fish," by I. I. Smirnov, S. I. Smirnov, and K. M. Sharaev, pp. 77-78.

"The effect of angle parameters of the knife on the cutting force during slicing of (tuna) fish," by M. A. Yakubov, pp. 75-77.

#### PROTEIN:

"Rapidity of the changes in nitrogenous constituents of fish muscle during autoclaving," by G. N. Kushalov, article, *Chemical Abstracts*, vol. 62, April 12,

1965, Abstract No. 9693h, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

#### PUERTO RICO:

Progress Report, Marine Biology Program, FY-1965, PRNC No. 60, 229 pp., illus., processed, April 1965. Puerto Rico Nuclear Center, University of Puerto Rico, Mayaguez, P. R. Reports on the program of research at the Puerto Rico Nuclear Center, including projects on: measurements of biological productivity (of plankton); analysis for selected trace elements (in sea water, marine organisms, river water, and other materials); measurements of concentration factors of selected organisms (sea urchin, some algae) for certain radioisotopes; measurements of radioactivity and radioisotopes now present in the marine organisms, waters, and bottom sediments off Puerto Rico; and background observations in physical and chemical oceanography off the west coast of Puerto Rico. A marine ecology project has been carried out on a limited scale in connection with 2 of the other projects. Ecological studies are concerned primarily with food web relationships.

#### QUALITY:

Temperature Measurement and Fish, by J. Graham, Torry Advisory Note No. 20, 12 pp., illus., printed, Jan. 1965. Torry Research Station, Ministry of Technology, P. O. Box 31, Aberdeen, Scotland.

#### RADIATION:

Effects of Nuclear Explosion on Marine Biology, edited by M. B. Schaefer, 144 pp., printed, Aug. 1956, \$1. Scripps Institution of Oceanography, University of California, La Jolla, Calif.

#### RETAILING:

The Care of the Fishmonger's Fish, by G. H. O. Burgess, Torry Advisory Note No. 1, 8 pp., illus., printed, Nov. 1963. Torry Research Station, Ministry of Technology, P. O. Box 31, Aberdeen, Scotland.

#### SALMON:

"Experiment using electrical fencing to stop the salmon on Luvenga River," by L. A. Petrenko and G. M. Mishelovich, article, *Rybnoe Khoziaistvo*, vol. 40, no. 8, 1964, pp. 41-43, printed in Russian, single copy 50 Kop. (about US\$0.55). *Rybnoe Khoziaistvo*, V. Krasnosel'skaia 17, Moscow B-140, U.S.S.R.

Processed leaflets from the Alaska Department of Fish and Game, Subport Bldg., Juneau, Alaska 99801.

Abundance, Size, Age and Survival of Red Salmon Smolts from the Ugashik Lakes System, Bristol Bay, 1964, by Michael L. Nelson, Informational Leaflet 62, 34 pp., illus., June 5, 1965.

The Age Composition of King Salmon Caught on Sport Fishing Gear in Southeastern Alaska, by Gary Finger and Robert Armstrong, Informational Leaflet 60, 15 pp., illus., May 25, 1965.

King Salmon (ONCORHYNCHUS TSHAWYTSCHA) Spawning Ground Surveys in the Behm Canal Area of Southeastern Alaska, by Vaughn Anthony, Gary Finger, and Robert Armstrong, Informational Leaflet 63, 39 pp., illus., processed, June 9, 1965.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Red Salmon Spawning Ground Surveys in the Nushagak and Togiak Districts, Bristol Bay, 1963, by Michael L. Nelson, Informational Leaflet 61, 24 pp., illus., June 1, 1965.

#### SANITATION:

"Diocid, a new disinfecting agent for the fishing industry," by L. N. Smolina and Yu. A. Ravich-Shcherbo, article, Rybnoe Khoziaistvo, vol. 40, no. 7, 1964, pp. 63-66, printed in Russian, single copy 50 Kop. (about US\$0.55). Rybnoe Khoziaistvo, V. Krasnosel'skaia 17, Moscow B-140, U.S.S.R. Diocid is a mixture of 1 hexa-decyl pyridinium bromide with ethanol mercurio-chloride.

#### SARDINES:

"Technochemical properties of Atlantic sardines and factors affecting their quality in industrial processes," by G. S. Khristoferzen and N. V. Timofeeva, article, Chemical Abstracts, vol. 62, April 12, 1965, Abstract No. 9695g, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

Articles from Tidsskrift for Hermetikindustri (Norwegian Cannery Export Journal), vol. 51, no. 6, June 1965, illus., printed. Tidsskrift for Hermetikindustri, Stavanger, Norway:

"Brisling--a product of Norway," pp. 214-220, in English.

"Sortering og frysing av brisling" (Grading and freezing of brisling sardines), by Per Tollefsen, pp. 209-211, in Norwegian.

#### SEALS:

"Feeding habits of the New Zealand fur seal (Arctocephalus forsteri)," by R. J. Street, article, Fisheries Technical Report No. 9, pp. 1-20, illus., printed, 1964. New Zealand Marine Department, P. O. Box 2395, Wellington, New Zealand.

#### SEAWEED:

"Syr'evye zapasy morskikh vodoroslei i perspektivy dal'neishego razvitiya promysla vodoroslei i trav v moryakh Dal'nego Vostoka" (Reserve stocks of marine seaweeds and prospects for the subsequent development of the algal and grass industry in the seas of the Far East), by V. F. Sarochan, article, Referativnii Zhurnal-Biologiya, 1964, Abstract No. 7V38, printed in Russian. Akademiia Nauk SSSR, Institut Nauchnoi-Informatsii, Moscow, U.S.S.R.

#### SHARK:

"Sharks and Survival--Some valuable tips revealed in new book," article, Sealift Magazine, vol. 15, no. 6, June 1965, pp. 15-18, illus., printed, single copy 20 cents. MSTs Sealift Magazine, U. S. Department of the Navy, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

#### SHELLFISH:

National Shellfish Sanitation Program Manual of Operations. Part III--Public Health Service Appraisal of State Shellfish Sanitation Programs, 27 pp., illus., processed, 1965, 40 cents. Public Health Service, U. S. Department of Health, Education, and Welfare, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office,

Washington, D. C. 20402.) Since 1925 the Public Health Service has worked with the states and the shellfish industry to insure that shellfish shipped in interstate commerce will be safe to eat. Each shellfish-shipping state adopts laws and regulations for sanitary control of the shellfish industry, makes sanitary and bacteriological surveys of growing areas, delineates and patrols restricted areas, inspects shellfish plants, and conducts any additional work necessary to insure that shellfish for consumption are healthful. Each state annually issues numbered certificates to shellfish dealers who comply with the sanitary standards, and forwards copies of the interstate certificates to the Public Health Service. This manual has been developed in response to a recommendation that objective procedures be established to guide the Public Health Service in reviewing each state shellfish sanitation program and that specific criteria be set up for PHS endorsement of those programs. The manual contains sections on: exercise of Public Health Service responsibilities in the National Shellfish Sanitation Program; the appraisal procedure; preparation of the rating officer's report; and supplemental program statistics required.

Proceedings, 5th National Shellfish Sanitation Workshop, November 17-19, 1964, edited by Leroy S. Houser, 249 pp., illus., processed, 1965. Shellfish Sanitation Branch, Public Health Service, U. S. Department of Health, Education, and Welfare, Washington, D. C. 20201. Contains the agenda of the 1964 Shellfish Sanitation Workshop, a report of papers presented, and related discussions. The appendixes consist of complete texts of papers read. Principal subjects covered are: status of the cooperative program for the certification of interstate shellfish shippers; status of shellfish depuration on a national scale and in the various states; pollution abatement in relation to shellfish sanitation; advances in oyster culture; conference of state sanitary engineers actions evaluating need for certification program for crabmeat and scallops; and regulatory problems on non-certified shellfish imports. Some other topics are: bacteriological criteria for shellfish growing areas; interim bacteriological criteria for oysters; initial survey on Clostridium botulinum toxin, type E; heat-shock method of preparation of oysters for shucking; and workshop resolution pertaining to pesticides.

#### SHRIMP:

Effect of Low Salinity on Oxygen Consumption in the Prawn PALAEMONETES VULGARIS, by R. Nagabhushanam and R. Sarojini, Contribution No. 177, 1 p., printed. (Reprinted from the Indian Journal of Experimental Biology, vol. 1, no. 4, 1963, pp. 231-232.) Virginia Institute of Marine Science, Gloucester Point, Va. 23062.

"Remarkable resource research," by Lyle S. St. Amant, article, Louisiana Conservationist, vol. 17, nos. 7 and 8, July-Aug. 1965, pp. 20-23, illus., printed. Louisiana Wild Life and Fisheries Commission, Wild Life and Fisheries Bldg., 400 Royal St., New Orleans, La. 70130. Evaluates 3½ years of intensive research on shrimp in waters along Louisiana's coastline, discussing the merit of that research in relation to the State's shrimp industry as a whole. Gives an overview of the gains in knowledge of shrimp as a result of the research program, including information on the basic shrimp cycle, factors controlling the cycle,



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probable production for 1965, breeding success and postlarval densities, juvenile distribution, density and growth, and early production. Finally, outlines the program's invaluable contribution to the industry.

Shrimp and Beer Party U. S. A., 6 pp., illus., printed, 1965. Shrimp Association of the Americas, 919 E. Levee, Brownsville, Tex. 78521. A recipe leaflet . . . "for serving 8 to 18 to 80 . . . Here are 8 classic dishes to adapt to almost any occasion, any number of guests." Preparation and serving instructions are given for shrimp dunk/U.S.A., neat shrimp in beer, marinated shrimp broil, stuffed shrimp appetizers, and other dishes.

"Utilization of Bering Sea shrimp (review of foreign literature)," by V. S. Gordievskaya, article, Rybnoe Khoziaistvo, vol. 40, no. 7, 1964, pp. 79-80, printed in Russian, single copy 50 Kop. (about US\$0.55). Rybnoe Khoziaistvo, V. Krasnosel'skaia 17, Moscow B-140, U.S.S.R.

#### SPAIN:

"El comercio exterior de conservas en 1964" (Foreign Trade in canned goods in 1964), by Mareiro, article, Industria Conservera, vol. 31, no. 309, March 1965, pp. 67-68, printed in Spanish. Industria Conservera, Calle Marques de Valladares, 41, Vigo, Spain. Dwells principally on canned fishery products--anchovy fillets, sardine, tuna, squid, and others.

#### SPINY LOBSTER:

"Holding wells in cray boats," by W. D. Hughes, article, Commercial Fishing, vol. 3, no. 9, May 1965, pp. 31, 33, illus., printed. Trade Publications Ltd., 26 Albert St., Auckland, New Zealand.

#### SPOILAGE:

"Bacteriology of spoilage of fish muscle. III--Characterization of spoilers," by Peter Lerke, Ralph Adams, and Lionel Farber, article, Applied Microbiology, vol. 13, no. 4, July 1965, pp. 625-630, printed, single copy \$3. The Williams and Wilkins Co., 428 E. Preston St., Baltimore, Md. 21202.

"Biochemical and nutritional studies on East Pakistan fish. VIII--Acetylcholinesterase activity in fresh and decomposed fish tissue and its relation with spoilage characteristics," by M. Qudrat-i-Khuda, H. N. De and N. M. Kahn, article, Chemical Abstracts, vol. 58, June 24, 1963, Abstract No. 14485e, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

#### SPORT FISHING:

Sport Fishing Today and Tomorrow, Overseas Fishery Series 6, 44 pp., illus., printed in Japanese. Japan Fisheries Resource Conservation Association, 6th Floor, Zenkoku Choson Kaikan Bldg., 1-17, Nagata-cho, Chiyoda-ku, Tokyo, Japan.

#### SWEDEN:

"Nya fiskesignaler fran den 1 september 1965" (New fishery signals after September 1, 1965), article, Svenska Vastkustfiskaren, vol. 35, no. 10, May 25, 1965, p. 174, printed in Swedish. Svenska Vastkustfiskarnas Centralforbund, Ekonomiskottet Postbox 1014, Goteburg 4, Sweden.

#### TARIFFS:

"World customs tariffs," article, International Commerce, vol. 71, no. 31, Aug. 2, 1965, pp. 2-12, illus., printed, single copy 35 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) The import tariff systems of about 120 foreign governments are summarized in this article, an initial survey of world markets to aid businessmen. The summary includes most countries--other than those whose foreign trade is a Governmental monopoly (principally communist countries). Where foreign countries' tariff schedules have been published abroad and are fairly current, their availability (including updating services) is reported in the summary. The countries are grouped by region--Western Hemisphere, Europe, Africa, Near East and South Asia, and Far East and Oceania.

#### TEXAS:

Let's Go Fishing, compiled by W. R. Long, 20 pp., printed, 1965. Texas Parks and Wildlife Department, Reagan State Office Bldg., Austin, Tex. 78701.

#### THAILAND:

First Guide to the Literature of the Aquatic Sciences and Fisheries in Bangkok, Thailand, Kasetsart University Fishery Research Bulletin No. 2, 50 pp., printed, April 15, 1965. Committee on Fishery Literature, Faculty of Fisheries, Kasetsart University, Bangkok, Thailand.

#### TIDES:

Manual of Tide Observations, Publication 30-1 (Revision of Special Publication No. 196), 72 pp., printed, June 1965, \$2. Coast and Geodetic Survey, U. S. Department of Commerce, Washington, D. C., 20230. Contains instructions for observing and recording the rise and fall of the tide and for making the necessary reductions to determine the datum planes and the non-harmonic quantities published in the Tide Tables.

#### TOXICITY:

"Ciguatera and other marine poisoning in the Gilbert Islands," by M. J. Cooper, article, Pacific Science, vol. 18, no. 4, 1964, pp. 411-440, printed. Pacific Science, University of Hawaii, Honolulu, Hawaii 96814.

The Distribution of Ciguatera in the Tropical Pacific, by Albert H. Banner and Philip Helfrich, Technical Report Series No. 3, 48 pp., processed, 1964. Hawaii Marine Laboratory, University of Hawaii, Honolulu, Hawaii.

#### TOXINS:

Biochemistry and Pharmacology of Biotoxins from Marine Animals, by F. Ghiretti, 21 pp., printed, Jan. 1965. Naples Zoological Station, Naples, Italy.

"Marine biotoxins. III--The extraction and partial purification of ciguatera toxin from Lutjanus bohar; use of silicic acid chromatography," by Donald W. Hessel, article, Chemical Abstracts, vol. 61, Oct. 26, 1964, Abstract No. 10920c, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

#### TRADE LISTS:

The following mimeographed trade lists may be bought by U. S. firms from the Commercial Intelligence Di-

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vision, Office of International Trade Promotion, Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. 20230, or from Department of Commerce field offices at \$1 each:

Boat and Ship Builders, Repairers and Chandlers--India, 19 pp., May 1965. Lists the names and addresses, size of firms, and types of vessels (including fishing craft) and provisions handled by each firm. Also contains basic industry and trade data on shipbuilding, repairing, and chandlery (includes fishing vessels).

Canneries and Frozen Foods--Producers and Exporters--Argentina, 10 pp., July 1965. Lists the names and addresses, size of firms, and types of products (including fish and shellfish) handled by each firm. Also contains trade and industry data (including fishery products) on production, exports and imports of canned and frozen foods.

#### TRANSPORTING FISH:

"Transporte de sardinha em camioneta isotérmica" (Transportation of sardines in isothermal trucks), by Alberto de Morais Lobo, article, Conservas de Peixe, vol. 20, no. 230, May 1965, pp. 15, 17-19, 32, printed in Portuguese. Sociedade de Revista Conservas de Peixe, Lda., Regueirão dos Anjos, 68, Lisbon, Portugal.

#### TRAWLING:

Available from White Fish Authority, Lincoln's Inn Chambers, 2/3 Cursitor St., London EC4, England:

An Acoustic Telemetry Link between Trawl and Ship--Measuring the Performance of the Trawl in Fishing Conditions, by Means of Sound Waves, Research Development Bulletin No. 7, 2 pp., processed, Jan. 1965.

Double-Rig Beam Trawling, Research Development Bulletin No. 8, 3 pp., illus., processed, March 1965.

Summarized Report of a Study of the Operation and Performance of the Trawl Winch on a Large Stern Trawler, Research Development Bulletin No. 1, 3 pp., processed, April 1964.

Trawl Gear Investigations, Research Development Bulletin No. 10, 3 pp., processed, May 1965.

Warp Load Meters for Stern Trawlers, Research Development Bulletin No. 6, 5 pp., illus., processed, Dec. 1964.

#### TRINIDAD AND TOBAGO:

Foreign Trade Regulations of Trinidad and Tobago, by Elliot Werner, OBR 65-33, 4 pp., printed, June 1965, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

#### TROUT:

"Trout industry of the Soviet Carpathians," by K. A. Altukhov, article, Rybnoe Khoziaistvo, vol. 40, no. 8, 1964, pp. 27-28, printed, single copy 50 Kop. (about US\$0.55). Rybnoe Khoziaistvo, V. Kransnoel'skaia 17, Moscow B-140, U.S.S.R.

#### TUNA:

"Le 'Boréal' champion de la campagne thonière africaine" (The "Boréal," champion of the African tuna season), by J. Lamarche, article, France Pêche, no. 95, May 1965, p. 31, illus., printed in French, single copy 2.50 F. (about US\$0.50). France Pêche, Boîte Postale 179, Lorient, France.

Chosasen Shoyo Maru Hokokusho (Higashitaiheiyo Nio-keru Maguroshigenchosa Oyobi Kokai-Hokokusho) (Report of the Experimental Boat Shoyo Maru--Cruise Report of Investigations on Tuna Resources in the Eastern Pacific), 465 pp., illus., printed in Japanese with English titles and legends, Aug. 1964. Research Division, Japanese Fisheries Agency, Ministry of Agriculture and Forestry, 2-1, Kasumigaseki, Chiyoda-ku, Tokyo, Japan. The first section of this detailed report outlines the tuna investigations conducted during a cruise of the Eastern Pacific--purpose and particulars of the investigations, course and dates of the cruise, technical data on the vessel "Shoyo Maru," and Japanese and United States researchers on board and their research work. Results of the investigations are presented in the second section--species of tuna, marlin, and other fish landed; results of oceanographic observations; and evaluation of a special type of long-line gear. The third section discusses problems of Samoa-based Japanese long-line operations. The fourth section covers problems encountered by a long-line vessel calling at a foreign port in the Eastern Pacific. And the final section presents information on business matters related to the cruise--log-book records; a narrative account of the cruise; and reports of deck, engineroom, communications, administrative and medical operations.

"Tuna spotting from a balloon," article, Australian Fisheries Newsletter, vol. 24, no. 7, July 1965, pp. 23, 26, illus., printed. Fisheries Branch, Department of Primary Industry, Canberra A.C.T., Australia.

Available from Kanagawa Prefectural Fisheries Experiment Station, 2451, Rokugo, Misaki-cho, Miura-shi, Kanagawa Prefecture, Japan:

On the Distribution of Mean Fork Length and Age Composition of Yellowfin Tuna and Albacore as Related with Distribution of Water Temperature and Distance from Continent in the Tropical Atlantic Ocean, by Jun Nakagome and others, 4 pp., illus., printed in Japanese with English summary, Aug. 1964.

Relation between Monthly Variation of Hooking Rate of Yellowfin Tuna and Monthly Variation of Surface Water Temperature, and between Annual Variation of Hooking Rate of the Fish and Annual Variation of Surface Water Temperature in the Tropical Atlantic Ocean, by Jun Nakagome, 5 pp., illus., printed in Japanese with English summary, March 1965.

#### TURTLES:

"The navigation of the green turtle," by Archie Carr, article, Scientific American, vol. 212, no. 5, May 1965, pp. 78-86, illus., printed, single copy 60 cents. Scientific American, Inc., 415 Madison Ave., New York, N. Y. 10017. These turtles are known to migrate regularly to and from nesting beach and feeding ground. Now it appears they can also navigate well enough to make an island landfall after 1,400 miles at sea.

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## UNITED KINGDOM:

Future Prospects in the Distant-Water Fisheries, by David Garrod and John Gulland, Laboratory Leaflet (New Series) No. 8, 50 pp., illus., processed, May 1965, Fisheries Laboratory, Ministry of Agriculture, Fisheries and Food, Lowestoft, Suffolk, England. There is widespread concern in the United Kingdom regarding the effects of increased fishing on the yields of the distant-water grounds in the North Atlantic and Arctic Oceans traditionally exploited by British fishermen; there is also a growing interest in the potential yields of fishing grounds in the Western and South Atlantic. In this leaflet, the authors have examined the future prospects for the Eastern Atlantic--Northeast Arctic cod and haddock, Iceland cod and haddock, and East Greenland cod; for the Western Atlantic--West Greenland, Labrador, Newfoundland and New England/Nova Scotia cod, Newfoundland haddock, and ocean perch. The long-term prospects for distant-water fisheries are also discussed. "In some stocks the level of production could actually be improved by reducing the amount of fishing, so that, for the purpose of obtaining the maximum amount of protein for the minimum of fishing effort, there is much to be said for some control of the amount of fishing," assert the authors. Appendixes include information on the fishing power of trawlers, sources of data, and the factors causing the decline in catch per unit of effort in North Atlantic fish stocks. Several statistical tables are also included.

"White Fish Authority," by Robert E. Lloyd, article, Geo Marine Technology, vol. 1, no. 7, July 1965, pp. 14-16, processed. Intel, Inc., 1075 National Press Bldg., Washington, D. C. 20004. The British White Fish Authority has given the equivalent of US\$96,600 to the Civil Engineering Department, University of Strathclyde, Scotland, to develop engineering criteria for commercial-scale ocean fish farming installations. Three experts will: (1) investigate problems of enclosing coastal waters; (2) conduct hydrographic studies of several sea lochs; and (3) evaluate the use of warm water effluent from thermoelectric power stations to achieve rapid growth rate of fish. This report on the White Fish Authority's functions explains the status of aquaculture in Britain.

White Fish Authority, Annual Report and Accounts for the Year Ended 31st March 1965, 55 pp., illus., printed, June 1965, 4s. 6d. (about US\$0.65). Her Majesty's Stationery Office, York House, Kingsway, London WC2, England. Covers white fish production, distribution and marketing, research and development, and administration of regulations. Appendixes contain data on quantity and value of white fish landed, 1963-64; the fishing fleet; grant and loan activities; the white fish subsidy for vessels; conservation of stocks; training; and costs and earnings in the in-shore fleet. Also includes the financial statement of the White Fish Industry Board, for the year ended March 31, 1965.

## U.S.S.R.:

"Soderzhanie polineasyshchennykh zhirnykh kislot v zhirakh osnovnykh promyslovykh ryb Azovsko-Chernomorskogo Basseina" (The content of polyunsaturated fatty acids in the fats of the main commercial fish stocks in the Azov-Black Sea basin), by G. S. Khristoferzen, article, Voprosy Pitaniya, vol. 23,

no. 5, 1964, pp. 17-20, illus., printed in Russian with English summary. Voprosy Pitaniya, Gosudarstvennoe Izdatel'stvo Meditsinskoi Literatury, Moscow, U.S.S.R.

Soviet Research in World Ocean, by L. A. Zenkevich and S. D. Osokin, Technical Translation No. 65-30827, 18 pp., printed, April 26, 1965, \$1. (Translated from the Russian, Morskoy Sbornik, no. 2, 1961.) Clearinghouse for Federal Scientific and Technical Information, U. S. Department of Commerce, Port Royal and Braddock Rds., Springfield, Va. 22151.

Articles from Rybnoe Khoziaistvo, vol. 40, 1964, printed in Russian, single copy 50 Kop. (about US\$0.55). Rybnoe Khoziaistvo, V. Krasnosel'skaia 17, Moscow B-140, U.S.S.R.:

"Experience of Volgograd Fishing Trust in the improvement of the organization of work and in the mechanization of loading and unloading operations in the production of refrigerated fish," by Yu. M. Danilov, no. 7, pp. 71-74.

"Improving the planning in the fishing industry," by E. P. Grinko, no. 8, pp. 3-5.

"New successes of Sakhalin fishing kolkhoses," by A. A. Taranov, no. 7, pp. 61-62.

"Some results of the work of the fishing industry in the Azov-Black Sea basin," by I. F. Denisenko, no. 8, pp. 6-8.

## VESSELS:

Decay in Wooden Fishing Boats, Research Development Bulletin No. 4, 3 pp., processed, Nov. 1964. White Fish Authority, Lincoln's Inn Chambers, 2/3 Cursitor St., London EC4, England.

"Konceptyje konstrukcyjne malych statkow rybackich" (Constructional designs of small fishing craft), by Tadeusz Wojcik, Witold Wakula, and Lucjan Debski, article, Budownictwo Okretowe, vol. 10, no. 5, May 1965, pp. 144-146, printed in Polish with English table of contents and abstract. Wydawnictwa Czasopism Technicznych NOT, Czackiego 3/5, Warsaw, Poland. Presents the specifications of small fishing vessels (seiner-trawlers) intended both for Polish fisheries and export.

## VITAMINS:

"Physicochemical determination of vitamin D in marine products," by Takeshige Yamakawa, article, Chemical Abstracts, vol. 62, Feb. 1, 1965, Abstract No. 3324f, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

"The relation between vitamin A content in livers and the feeding habitat of fishes in the Red Sea," by M. M. Abdallah and M. K. Salah, article, Journal of Pharmaceutical Science of the United Arab Republic, vol. 2, no. 1, 1961, pp. 135-138, printed. Journal of Pharmaceutical Science of the U.A.R., Al-Majlis Al-A'La Lil-'Ulum, Cairo, United Arab Republic.

## WEATHER CHARTS:

The following processed weather charts, 4 pp., each, are published by the Weather Bureau, U. S. Department of Commerce, Washington, D. C., and are for

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sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402, 10 cents each. Charts show stations displaying small craft, gale, whole gale, and hurricane (for coastal chart only) warnings; explanations of warning displays; and schedules of AM and FM radio and TV stations that broadcast weather forecasts and warnings.

Coastal Warning Facilities Chart, Eastport, Me. to Montauk Point, N. Y. 1965.

Small Craft, Gale, and Whole Gale Warning Facilities Chart, Great Lakes: Superior and Michigan, 1965.

#### WHALE OIL:

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#### WHALES:

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### TUNA PIZZA BURGERS FOR THE GANG

Here's a unique blend from the Tuna Research Foundation that brings together three of America's favorite foods--burgers, pizzas, and tuna. This is a great recipe to fix when people drop in unexpectedly. (Of course it's fine for company you expect, too.)

Because they're made with convenient canned tuna, you won't have to wait around the broiler forever until the tuna pizza burgers are done. They only take 10 minutes to heat and brown, and you can open up the soda pop in the meantime.

#### TUNA PIZZA BURGERS

$\frac{1}{3}$ cup mayonnaise	$\frac{1}{2}$ cup diced celery
$\frac{1}{4}$ teaspoon salt	2 cans ( $6\frac{1}{2}$ or 7 ounces each) tuna
$\frac{1}{4}$ teaspoon each oregano and basil	in vegetable oil
1 tablespoon minced onion	6 burger buns
	1 can (8 ounces) tomato sauce
	Grated Parmesan cheese

Blend together mayonnaise, salt, oregano, basil, and onion. Mix in celery and tuna. Pile tuna mixture on bottom halves of buns. Spoon tomato sauce on top. Sprinkle with Parmesan cheese. Place under broiler heat until heated through and brown on top (about 10 minutes). Top with other bun halves. Makes 6 servings.











## HIGHLIGHTS IN THIS ISSUE (OCTOBER 1965)



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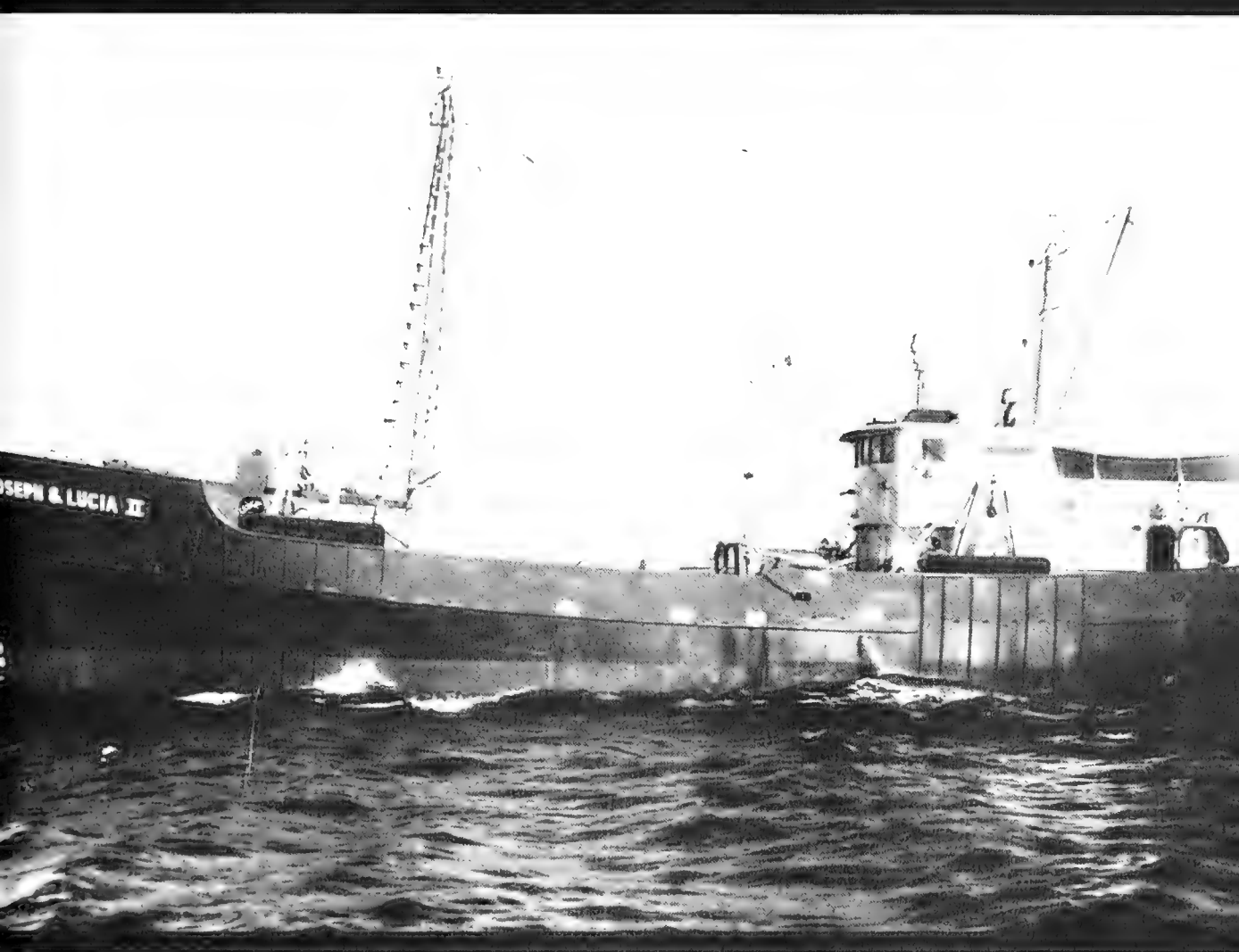
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# COMMERCIAL FISHERIES REVIEW



VOL. 27, NO. 11

NOVEMBER 1965

**UNITED STATES DEPARTMENT OF THE INTERIOR**  
*Fish and Wildlife Service*  
**Bureau of Commercial Fisheries**  
*Washington, D.C.*





# COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries  
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor  
G. A. Albano and H. Beasley, Assistant Editors

Address correspondence and requests to the: Chief, Fishery Market News Service, U. S. Bureau of Commercial Fisheries, 1815 North Fort Myer Drive, Room 510, Arlington, Va. 22209.

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5/31/68

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COVER: Joseph & Lucia II, a new steel trawler operating out of Gloucester, Mass., is equipped with a number of safety features: (1) an 8-man inflatable liferaft; (2) skid-resistant surface on deck and on main winch platform; (3) guard rails on deck bollards; (4) forecandle escape hatch; (5) pneumatic controls on trawl winch; (6) level winder for trawl wire; and (7) pilothouse controls for main engine. Those are some of the leading safety features recommended for medium or large otter-trawl vessels. The 96-foot vessel, built early in 1965 by a shipyard in Somerset, Mass., is powered by a 680-horse-power diesel engine.

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## PACIFIC COAST WHALE-MARKING PROGRAM

Data collected by the U. S. Bureau of Commercial Fisheries during the 1964/65 whale-marking program off the Pacific Coast was in the process of being analyzed earlier this year by scientists of the Bureau's Tuna Resources Laboratory, La Jolla, Calif. The whale-marking program is conducted annually between December and March by the Bureau.

Bureau biologists "mark" the whales by firing a 10-inch projectile of stainless steel tubing into the thickest part of the blubber. The numbered projectile is harmless to the whale and provides much valuable information if the marine mammal is caught by whalers. The whale-marking program has permitted scientists to study many factors in the life cycle of various whale species, including population, migration, longevity, and mortality.



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# COMMERCIAL FISHERIES REVIEW

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## DISTRIBUTION, ABUNDANCE, AND SIZE OF SABLEFISH (*Anoplopoma fimbria*) FOUND IN DEEP WATER OFF THE MOUTH OF THE COLUMBIA RIVER

By Hiromu Heyamoto\* and Miles S. Alton\*

### ABSTRACT

Sablefish were taken at depths of 50 to 650 fathoms during Bureau of Commercial Fisheries-Atomic Energy Commission trawling surveys off the Columbia River, Ore. The surveys, which began in June 1961, were conducted on a seasonal basis at stations located at 25-fathom depth intervals from 50 to 500 fathoms, and at seven additional stations located at varying depths from 600 to 1,050 fathoms. Sablefish catches were generally greater at depths from 200 to 450 fathoms than from any other depth. Catches ranged from 400 to 2,100 pounds per hour trawled. The sizes of sablefish taken ranged from 10 to 37 inches. The mean size of sablefish increased as the depth increased.

Sablefish in a spawning condition were encountered in March.

Data from these cruises and recent data from the Japanese gill-net fishery and exploratory cruises of the John N. Cobb indicate that a large population (or populations) of sablefish occurs in 200 to 400 fathoms of water off the coasts of Oregon, Washington, and in the Gulf of Alaska.

### INTRODUCTION

In the years subsequent to World War II there has been increasing evidence collected by scientists (Alverson, et al. 1964, Isaacs 1960, Pneumo-Dynamics Corporation 1961) that sablefish (fig. 1) are perhaps more abundant in deep water (below 200 fathoms) than had been previously anticipated. The initial success demonstrated by Japanese fishing operations along the continental slope in the eastern Bering Sea and Gulf of Alaska have tended to confirm the availability of sablefish in deep water. It has been suggested that the greatest abundance of the species may occur at depths generally beyond the range that they are exploited by North American long-line and trawl vessels.

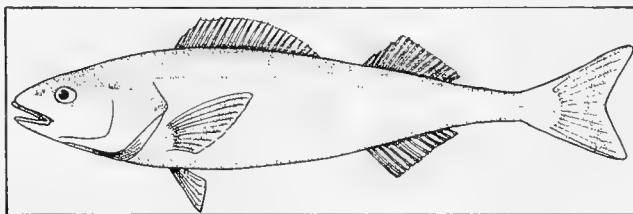


Fig. 1 - Sablefish, *Anoplopoma fimbria*.

In June 1961 the U. S. Bureau of Commercial Fisheries, in cooperation with the Atomic Energy Commission (A.E.C.), initiated a study of the marine fauna in the area southwest of the mouth of the Columbia River. Although the cooperative Bureau-A.E.C. project had many objectives, one important aspect of the investigation was assessing on a time basis the abundance and distribution of bottom fish and invertebrates inhabiting the Outer Continental Shelf and slope. An additional objective of the study was to ascertain whether fish were sufficiently abundant in deep water (depths of greater than 200 fathoms) that they might in the future support commercial fish operations.

Data from this investigation, collected from June 1961 through November 1963, have been assessed to provide more detailed information concerning the bathymetric distribution and relative abundance of sablefish on the continental slope and shelf.

\*Fishery Biologists (General), Exploratory Fishing and Gear Research Base, U. S. Bureau of Commercial Fisheries, Seattle, Wash.

U. S. DEPARTMENT OF THE INTERIOR  
Fish and Wildlife Service  
Sep. No. 744

## METHODS AND GEAR

In order to obtain information on the community of demersal fish inhabiting the waters adjacent to the Columbia River, a trackline was established southwest of the Columbia River lightship at depths between 50 and 1,050 fathoms. During the initial cruise, June 1961, trawl stations were established at 25-fathom intervals at depths from 50 to 450 fathoms. In subsequent cruises deeper stations were established at depths of 475, 500, 600, 650, 750, 850, 900, and 1,050 fathoms. Geographic locations of those stations are given in table 1. The shallowest

Table 1 - Positions of Bureau of Commercial Fisheries-Atomic Energy Commission Trawling Stations off the Columbia River, Oreg.

Station Designation	Depth (Fathoms)	Position		Station Designation	Depth (Fathoms)	Position	
		N. Lat.	W. Long.			N. Lat.	W. Long.
1A	50	46°08.2'	124°12.3'	14A	375	45°56.7'	124°51.0'
2A	75	46°07.4'	124°31.6'	15A	400	45°53.6'	124°52.6'
3A	100	46°03.4'	124°39.4'	16A	425	45°59.2'	124°52.1'
4A	125	46°02.2'	124°43.1'	17A	450	45°54.1'	124°55.5'
5A	150	46°02.8'	124°43.8'	18A	475	45°52.2'	124°52.5'
6A	175	45°59.6'	124°44.1'	19A	500	46°02.7'	124°57.3'
7A	200	46°00.3'	124°45.4'	23A	600	45°44.5'	124°53.9'
8A	225	45°58.2'	124°45.0'	25A	650	45°44.3'	124°54.0'
9A	250	45°58.2'	124°46.2'	29A	750	45°36.3'	124°53.7'
10A	275	45°59.9'	124°49.1'	31A	800	46°01.8'	125°04.5'
11A	300	45°57.5'	124°48.8'	33A	850	45°54.0'	125°08.8'
12A	325	45°58.0'	124°50.3'	35A	900	45°50.0'	125°10.6'
13A	350	45°56.0'	124°49.5'	41A	1,050	45°42.2'	125°13.0'

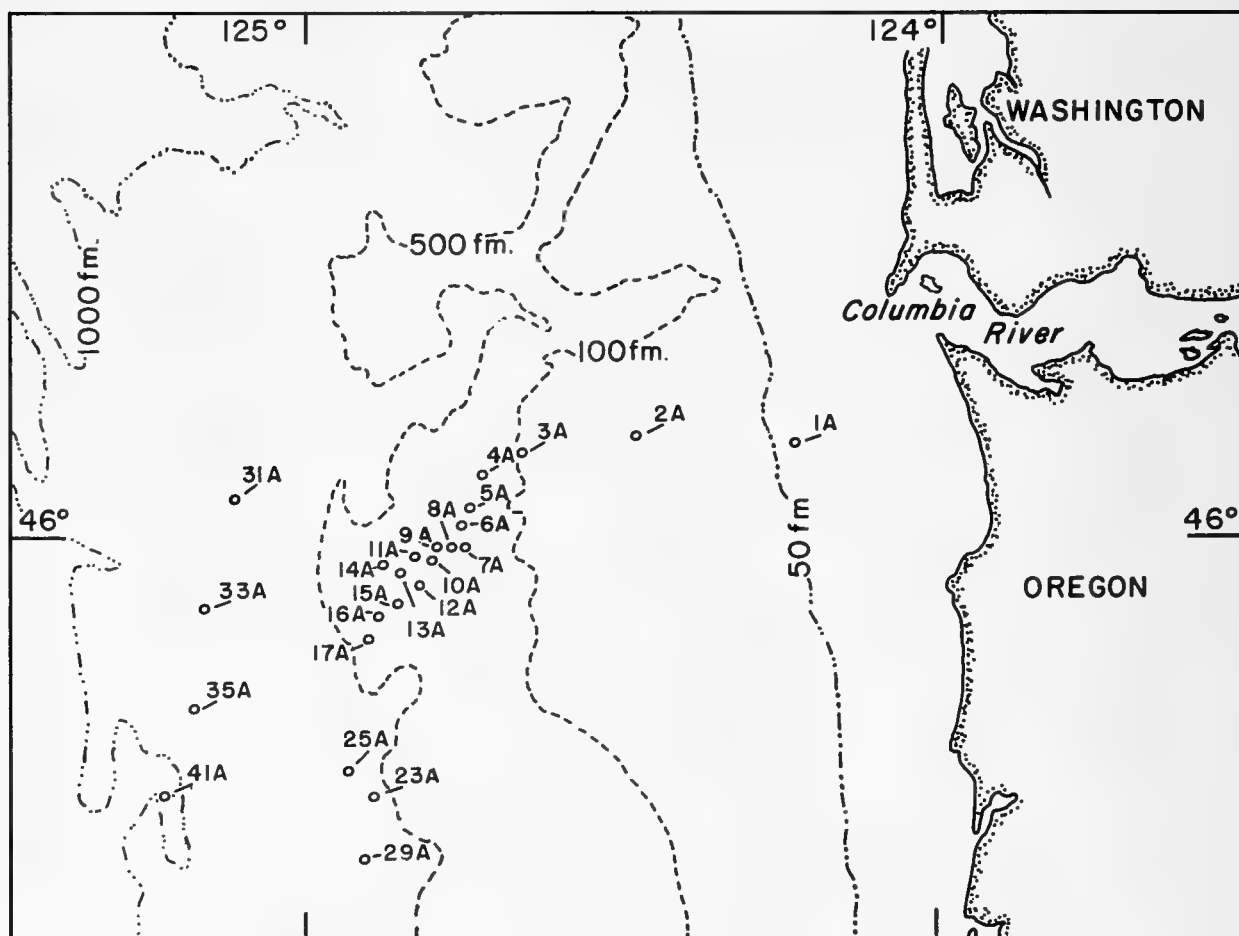


Fig. 2 - Bureau of Commercial Fisheries-Atomic Energy Commission trawling stations off the mouth of the Columbia River.

station (50 fathoms) is located approximately 5 miles southwest of the Columbia River light-ship, and other stations are found along a trackline extending in the same general direction to the 1,050-fathom depth contour (fig. 2).

Stations have been frequented approximately four times each year. As originally intended, it was hoped that all stations could be occupied once during each cruise. However, bad weather frequently hampered deep-water operations. Thus, the stations at depths between 50 and 450 fathoms received major emphasis, while stations at greater depths were only occasionally sampled.

The trawl surveys were conducted from aboard the 93-foot Bureau of Commercial Fisheries' exploratory fishing vessel John N. Cobb and from aboard the 68-foot M/V Commando which was chartered from the University of Washington. Both vessels were rigged with standard trawl gear and 1,000 fathoms of cable on each of two drums, which enabled fishing to be conducted to depths of 1,050 fathoms.

Duration of drags made at the 50- and 75-fathom stations was one-half hour, while at greater depths the nets were normally towed for one hour.

Standard 400-mesh eastern commercial otter trawl nets were used to sample the bottom fauna from 50 to 450 fathoms. A western trawl was used during part of the winter cruise in 1962 but was subsequently replaced with an eastern trawl. Since the trawls were constructed of  $3\frac{1}{2}$ -inch webbing, a  $1\frac{1}{2}$ -inch mesh liner was placed in the cod end to retain small fish and invertebrates. Commercial aluminum alloy 8-inch diameter floats were used on the headrope of the trawls.

Gulf of Mexico shrimp trawls were used to sample stations at 500-fathom depths and greater. A 43-foot shrimp trawl was used during the initial surveys but was replaced with a 72-foot semiballoon trawl, when it was found that the latter could be operated satisfactorily in deep water. Glass floats ( $4\frac{1}{2}$  inches in diameter) were attached to the headrope of the trawls, since aluminum floats could not withstand the pressure at depths of 500 fathoms and greater. As the amount of towing cable available on each drum did not permit double warps (tow cables) to be used in deep water, the shrimp trawl was fished from cables fastened from the two drums in tandem.

Fishing methods with the eastern trawl were similar to those commonly employed by Pacific coast otter trawl vessels. The net was set from the stern and retrieved on the starboard side. Towing speeds varied between 1.8 and 3.0 knots and averaged about 2.5 knots for most tows. Scope ratios used (ratio of tow line to depth of water), on the average, decreased as the depth of water fished increased. Ratios varied from about 3 to 1 at depths of 50 to 100 fathoms to about 2.5 to 1 at 125 to 475 fathoms. Scope ratios were as low as 1.6 to 1 at greater depths.

The catch was emptied into the starboard checker and separated by species. Estimates were made of the pounds of each species caught by multiplying its observed average weight by the total count of individuals in the catch.

The majority of sablefish length measurements used in this report were collected by Oregon Fish Commission personnel during their tagging and maturity studies. Fork-length measurements were made to the nearest centimeter and converted to inches. The Oregon Fish Commission maintains a separate contract with the Atomic Energy Commission for their sablefish migration study but used the Bureau's chartered vessel for tagging.

## RESULTS

During the period covered by this report, 189 drags were made on the trackline at depths from 50 to 1,050 fathoms. Sablefish were taken at stations sampled from 50 to 650 fathoms, but were encountered only infrequently at depths greater than 475 fathoms.

AVAILABILITY BY DEPTH: The seasonal catch rate of sablefish by depth for the years 1961 through 1963 are shown in figure 3.

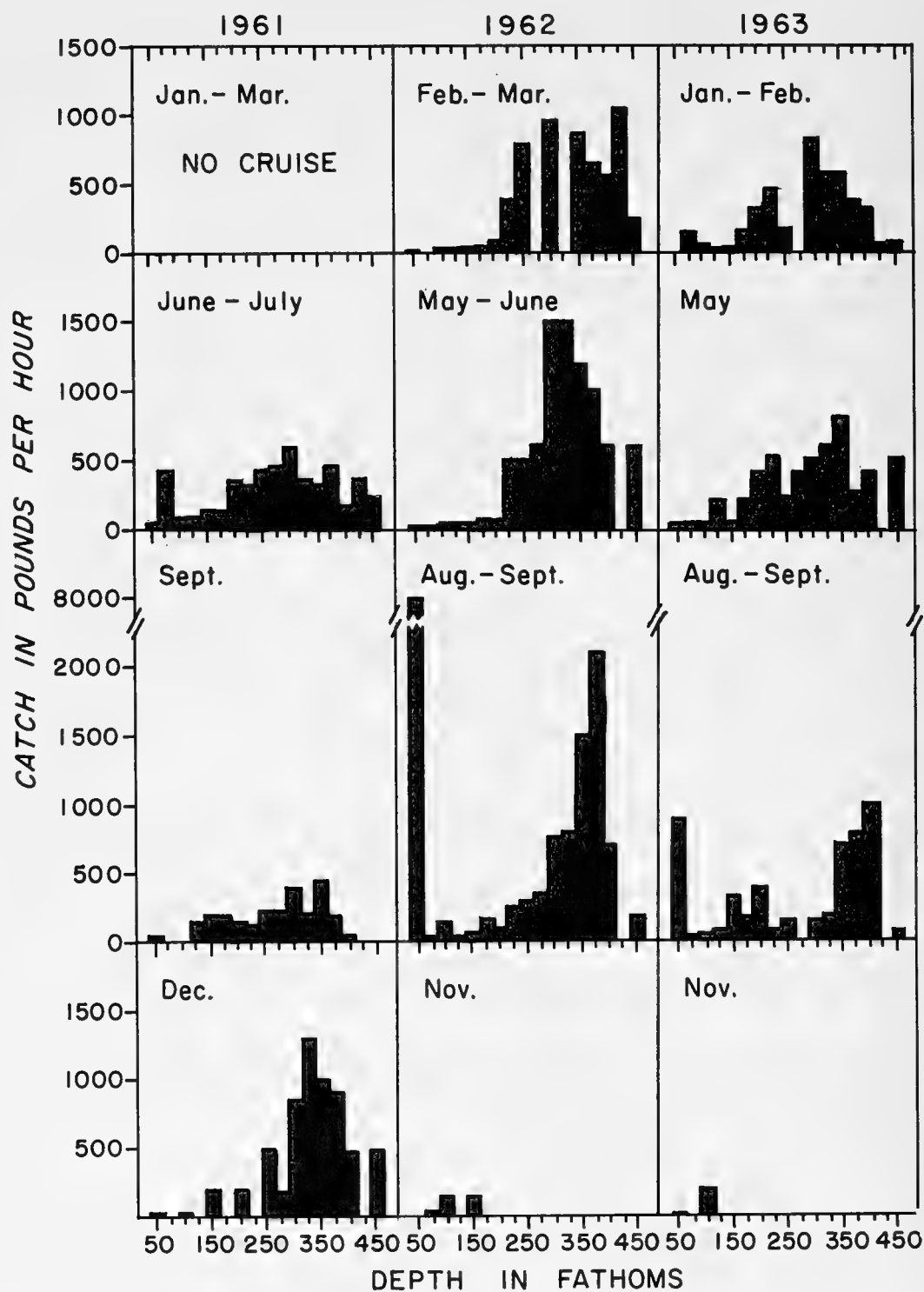


Fig. 3 - Seasonal catches of sablefish by depth for the years 1961-1963 off the mouth of the Columbia River.



Highest catch rates for sablefish were normally attained at stations from 200 to 450 fathoms in depth. A marked seasonal change in availability of the species on the Continental Shelf is implied both in 1962 and 1963. During December through June few sablefish were encountered on the Continental Shelf (50 to 100 fathoms); however, in August and September they were taken in large numbers at depths shallower than 100 fathoms. If the data are examined by years some between-year variation is noted in relative abundance and in bathymetric distribution patterns. For the most part, however, the relative abundance patterns by depth are similar for each of the three years studied. For example, in 1961 the highest catch rates for sablefish on the continental slope were attained at stations occupied from 200 down to 400 fathoms, in 1962 at depths from 225 to 450 fathoms, and in 1963 at depths from 200 to 450 fathoms. In all years relatively large catches of sablefish were encountered on the Continental Shelf (at depths of 100 fathoms or less) during the summer months.

In general, the catch rates on the continental slope were higher in 1962 than for 1961 and 1963, although the trend in availability of sablefish by depth was similar in that year to that encountered in 1961 and 1963. The availability of sablefish in deep water was particularly demonstrated in 1962 when catches exceeding 1,000 pounds per hour fishing were taken at the 300-, 325-, and 425-fathom stations, and a catch of over 2,000 pounds per hour fishing was encountered at the 375-fathom station (August-September cruise).

**CATCH OF SABLEFISH IN RELATION TO CATCH OF ALL FISH SPECIES:** The contribution of sablefish to the total fish catch by weight was considerably greater at depths from 250 to 450 fathoms than at shallower depths (fig. 4). An exception occurred in 1962 when sablefish comprised 71 percent of the total fish catch at 50 fathoms.

In all years sablefish comprised over 50 percent of the catches at most stations from 275 to 450 fathoms. Highest contributions of sablefish at those depths were 81 percent at 325 fathoms in 1961, 90 percent at 375 fathoms in 1962, and 83 percent at 325 fathoms in 1963.

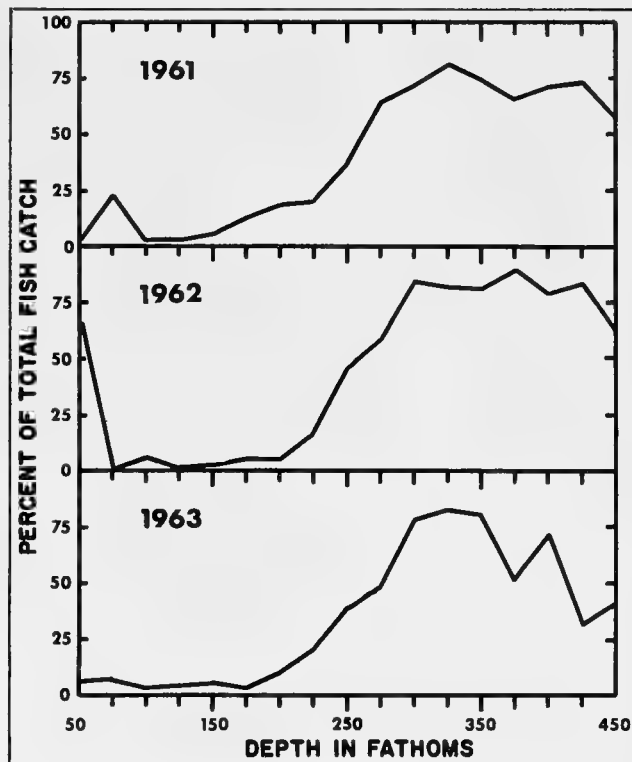


Fig. 4 - Percentage of total catch of fish species comprised of sablefish by 25-fathom depth intervals for the years 1961-1963.

**SIZES OF SABLEFISH CAUGHT:** Sablefish sampled during the Columbia River trackline studies have ranged from 10 to 37 inches in length. Examination of size samples of sablefish by depth (fig. 5) suggest that larger, older fish inhabit deeper portions of the overall bathymetric range. In both 1962 and 1963 fish taken at depths from 50 to 125 fathoms were smaller than those taken from greater depths. The trend towards larger average size fish with increased depth was observed through all seasons of the year.

The average size of fish taken in the shallower stations (50 to 125 fathoms) in 1962 and 1963 was 15 inches, and within that depth range almost 98 percent of the sampled fish were less than 22 inches in length.<sup>1/</sup> Examination of table 2 shows that a sharp decrease occurs in the percentage of fish less than 22 inches in length taken at depths greater than 125 fathoms. For example, in 1962, 71 percent of the fish measured at stations from 150 to 225 fathoms were less than 22 inches in length, and at depth intervals between 250 and 325 fathoms and 350

<sup>1/</sup>Current minimum legal size allowable for commercial vessels by the States of California, Oregon, and Washington.

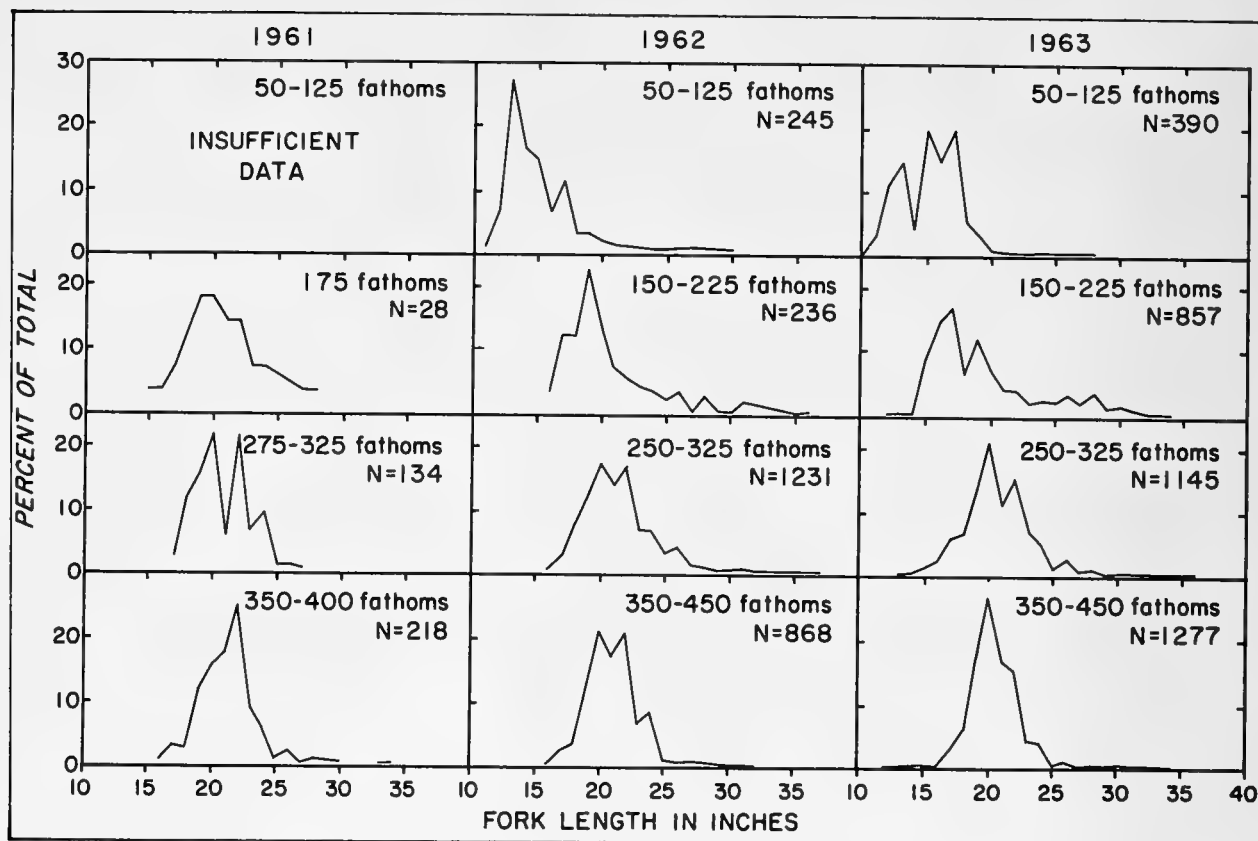


Fig. 5 - Length frequencies of sablefish by depth categories for the years 1961-1963.

to 450 fathoms the percentages of sablefish taken less than 22 inches were 56 and 57, respectively. Fish taken at depths equal to or greater than 250 fathoms averaged 6 inches larger than those sampled at stations from 50 to 125 fathoms (table 3).

Table 2 - Percentage of Measured Sablefish Less Than 22 Inches in Fork Length by Depth Intervals for the Years 1962-1963

Year	Depth Intervals in Fathoms			
	50-125	150-225	250-325	350-450
1962 . . . . .	96	71	56	57
1963 . . . . .	99	74	64	72
Average (1962-63) .	98	73	60	66

Table 3 - Average Fork Lengths of Sablefish by Depth Intervals for the Years 1961-1963

Depth Interval in Fathoms	Average Fork Length in Inches			
	1961	1962	1963	1961-1963
50-125	-	15.2	15.2	15.2
150-225	20.7	20.6	19.6	19.8
250-325	20.8	21.5	20.7	21.1
350-450	21.6	21.3	20.6	21.0

**SIZE OF MATURITY:** Sablefish in spent or spawning condition were encountered during early March 1962. They were taken at depths of 300 to 450 fathoms along the trackline and at 275 fathoms off the coast of Washington by the John N. Cobb during a bottomfish survey cruise.

Gonads of fish taken from those depths were examined to determine size at maturity. Sablefish sampled ranged from 16 to 32 inches in length. All fish smaller than 17 inches were immature, while those larger than 22 inches were mature. In the intermediate size group (17 to 22 inches), the percentage of mature fish increased with size.

#### DISCUSSION

The relatively high availability of sablefish on the continental slope at depths between 200 and 475 fathoms supports evidence of earlier scientific explorations that maximum abundance

of sablefish occurs in relatively deep water. The relative abundance of sablefish with depth off the Columbia River appears to be similar to that indicated for the Gulf of Alaska by Japanese commercial operations. During the period April 23-June 30, 1963, the Japanese vessel Seiju-Maru No. 3 caught 559 tons of sablefish in the Gulf of Alaska (Tanonaka and Alverson 1963). Using gill nets which ranged from 5.4 to 6 inches (stretched measure), the Japanese vessel reported good catches of sablefish at depths between 273 and 492 fathoms.

The fish taken in the gill nets averaged 27 inches in length, somewhat larger than those reported in trawl catches taken off the Columbia River at similar depths. However, this does not necessarily indicate that the average size of sablefish in the Gulf of Alaska inhabiting similar depth zones is larger than that for the Columbia River region. Gill nets are much more selective to a particular size of fish than otter trawls, therefore, the average size of fish taken by these gears is not directly compared. Regardless of the differences in average size of sablefish taken in the Gulf of Alaska as compared to those off the Columbia River, the depth range of best Japanese gill-net catches corresponds well to those of largest catches taken during Bureau explorations off the mouth of the Columbia River.

Although no evidence suggests that larger fish in deep water moved either inshore or offshore to any great extent within the year, inferential evidence suggests that the immatures in shallow water move into deeper water during winter months. The apparent differential size of sablefish with depth also suggests that there is a downward migration with increasing age.

Alverson (1960) noted the disappearance of small sablefish from inshore fishing grounds (20 to 60 fathoms) during October and November, and suggested a movement into deep water. This observation coincides with data obtained along the Columbia River trackline in that small sablefish were available only during the summer months at the 50-fathom stations.

Tagging studies on small sablefish (12 to 24 inches) conducted by Pruter (1959) at Holmes Harbor, Wash., also suggested an offshore movement which supported Alverson's supposition. Pasquale (1964) recently reported recovery of three sablefish tagged at the Holmes Harbor site from the Japanese fishery on the continental slope in the eastern Bering Sea.

Tagging in Holmes Harbor during subsequent years has shown that two size groups are present each year which are about 15 and 20 inches in length. Recoveries of tagged fish from the 15-inch group at the tagging site a year later showed growth into the 20-inch group. No recoveries were reported in the area of the tagging site for fish tagged within the 20-inch group. The absence of recoveries from that group in the area of the tagging site and their subsequent appearance in the offshore fishery suggests a movement of those fish into offshore waters and into greater depths.

Although the cooperative Bureau-A.E.C. data collected to date do not show distinct seasonal bathymetric movements for mature fish, some evidence suggests sablefish may have rather extensive north-south migrations. Holmberg and Jones (1954) reported one fish tagged off Newport, Oreg., was recovered 350 miles south of Fort Bragg, Calif., 390 days after tagging, and another tagged off Cape Beale, British Columbia, was caught some 210 miles to the north near Triangle Island, B. C., 310 days subsequent to tagging. Edson (1954) also reports one fish tagged off Middleton Island in the Gulf of Alaska was caught off Cape Flattery, Wash., showing a minimum movement of 1,230 miles. These sporadic recoveries showing long migrations seemed relatively unimportant until the recovery of the three tags in the eastern Bering Sea which were released in Holmes Harbor, Wash. This long migration seemed more important in the light of the fact that only a few offshore recoveries have been made from the Holmes Harbor tagging operations.

Low recovery rates for tagging studies conducted on sablefish have in the past been attributed to shedding of tags, faulty tags, low fishing intensity, and poor condition of tagged fish (high tagging mortality). All of these factors could have a considerable effect on the recovery rate. But perhaps of even more significance is the fact that little or no commercial fishing has occurred at depths where the species is most abundant and throughout most of the geographic range that this species inhabits. Thus low tagging recoveries may imply a large population which is subject to a relatively low fishing rate.

The data collected from the cooperative Bureau-A.E.C. study, recent Japanese fisheries in the Gulf of Alaska, and other exploratory cruises conducted by the John N. Cobb suggest a relatively large population (or populations) of sablefish inhabit waters throughout much of the eastern Pacific at depths from 200 to over 400 fathoms. It would appear that the sablefish population represents one of the large latent resources contiguous to our coast.

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### SEABED DRIFTER RELEASED BY U. S. RESEARCH VESSEL RETURNED BY SOVIET TRAWLER

A seabed drifter, released by the U. S. Bureau of Commercial Fisheries research vessel Albatross IV in a program of study to trace bottom currents in the Northwest Atlantic Ocean, was recovered earlier this year by a Soviet trawler fishing south of Long Island. It was returned by way of PINRO (Polar Research of Marine Fisheries and Oceanography) located at Murmansk, apparently the home base of the trawler. It was the second seabed drifter from the Bureau's Woods Hole Biological Laboratory program that was recovered and returned by a Soviet fishing vessel.

Seabed drifters are drifting plastic objects used to obtain information about the movements of the water near the seabed. The type used in the United States has a red stem and yellow saucer-like device, with the serially numbered return labels and instructions for its return stuck to the saucer.



Created in 1849, the Department of the Interior—a department of conservation—is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

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# SHRIMP POTENTIAL OF THE EASTERN GULF OF GUINEA

By Alan R. Longhurst\*

## ABSTRACT

Recent surveys by commercial interests off the Nigerian coast have confirmed earlier research surveys which indicated the presence of two main species of commercially important shrimp in the eastern Gulf of Guinea. Of the two, the large *Penaeus duorarum* occurs mainly offshore in 15-25 fathoms; the smaller *Parapenaeopsis atlantica* occurs in larger numbers closer to the coast in 5-15 fathoms. Neither species penetrate into the cold water below the thermocline, at which depths other but less important species occur. It is shown from a short review of published data that this situation is similar to that which occurs throughout the tropical Gulf of Guinea wherever shallow-water deposits are suitable for shrimp.

## INTRODUCTION

Recent explorations by American and Norwegian interests of the shrimp stocks of the Bights of Benin and Biafra have given encouraging results (Anon 1965) and the first commercial shipments have been made to New York City by a Lagos cooperative. These results seem to confirm the earlier suggestions that a shrimp stock of potentially great value exists in the eastern Gulf of Guinea (Longhurst 1961). A review of available information about that resource--mostly in the form of mimeographed reports, difficult of access--seems desirable.

As in other places in tropical West Africa, the fleet of small otter trawlers which has worked for some years out of Lagos (fig.1) has landed small quantities of shrimp incidental to the catch of croaker, drum, grunt, threadfin, catfish, and other species which have made up the major part of the landings. Shrimp landings totaled only 15.9 metric tons in 1961 as compared with total landings of 3,480 tons of fish. Much of the shrimp was sold at very low prices for local consumption, with only a small proportion sold at a good price in the local "supermarket" trade. On many vessels the shrimp landed was simply considered the perquisite of the trawler crews and their friends.

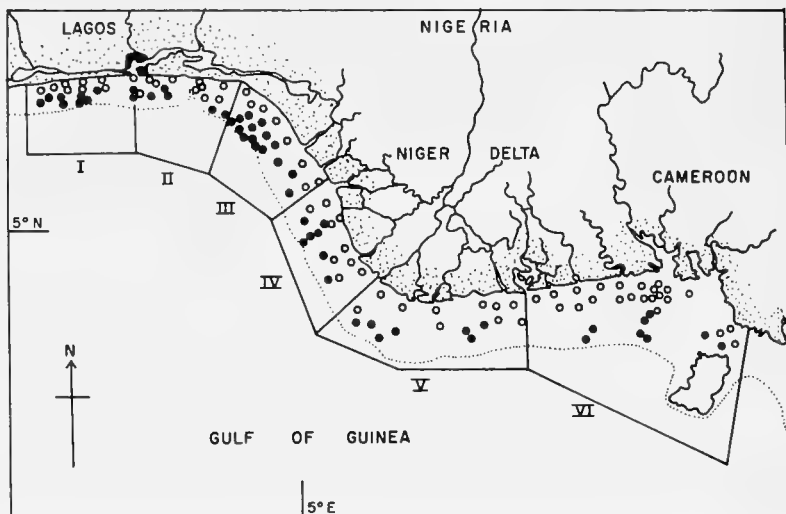


Fig. 1 - The coastline of the eastern Gulf of Guinea from Nigeria to the Cameroons. Shows the locations of trawl hauls made during the 1961-63 surveys by Federal Fisheries Service. The solid circles represent stations at which the sub-thermocline fish fauna was found; the open circles are stations at which the shallow above-thermocline fauna was found. The distribution of commercial shrimp corresponds to the distribution of the latter fauna.

## SURVEY OF RESOURCES

Preliminary surveys of the crustacean resources carried out in 1961-63 by the Federal Fisheries Service of Nigeria with the research vessels *Kingfisher* and *Kiara* (fig. 2) showed what species were present and what was their approximate distribution. The commercially important shrimp consisted of two species which inhabited muddy bottoms from close to the beach out to the depth of the thermocline at about 20-25 fathoms, but did not penetrate deeper into the cold water below.

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Fig. 2 - The research vessel Kiara of the Federal Fisheries Service of Nigeria; an all-steel stern trawler equipped also for oceanographic survey and fisheries biology work. She was built in Great Britain for the Nigerian Government.

These two species (fig. 3) are the pink shrimp, Penaeus duorarum (which occurs also in the Gulf of Mexico) and a smaller, redder species, Parapenaeopsis atlantica, that has no common name and which is more abundant and occurs in rather shallower water than Penaeus duorarum. In experimental trawling with Kiara off Lagos in 1961, for example, the following numbers of the two species were obtained in the fish catches:

Depth	<u>Penaeus duorarum</u>	<u>Parapenaeopsis atlantica</u>
	No.	No.
5-20 fathoms	66	2,693
20-40 fathoms	50	1

Such a catch distribution of the two species was quite typical of the incidental trawler landings of shrimp in recent years at Lagos; a third species, the striped or tiger shrimp (Penaeus kerathurus) occurs in very small numbers on the same grounds, and by itself is of no commercial importance.

Two smaller species, the white shrimp Palaemon hastatus and Hippolysmata hastatoides, occur along the Nigerian coast in very considerable numbers just outside the surf-zone during the rainy season. At Lagos a beach-seine fishery during July and August may take half a ton at a single draw. Those two species have not been taken in depths workable by a trawler and are in any case too small (less than one inch long) to be of any value to a mechanized fishery, though they are an acceptable item on the indigenous markets.

In deeper water, below the thermocline and below the range of Penaeus duorarum and Parapenaeopsis atlantica, another species, Parapenaeus longirostris (fig. 3), occurs in small numbers probably as far as the continental edge in 100 fathoms.

Along the 100-fathom line and down to 200-300 fathoms there is found, as in the Gulf of Mexico, a completely different fauna of bright red shrimp of the genera Plesionika, Systellaspis, and Heterocarpus, some of which perhaps have a commercial potential if the problem of working shrimp trawls at such depths on the very steep Continental Slope can be solved satisfactorily.

During 1963, the Kiara systematically surveyed the demersal fish stocks (table 1), from the Dahomey border to the Cameroons and made about 120 one-hour hauls with a 40-foot otter trawl on the Nigerian continental shelf (fig. 1). During that survey, the occurrence of shrimp in the trawl catches was, of course, noted. The main results (Anon. 1963) showed, as had been

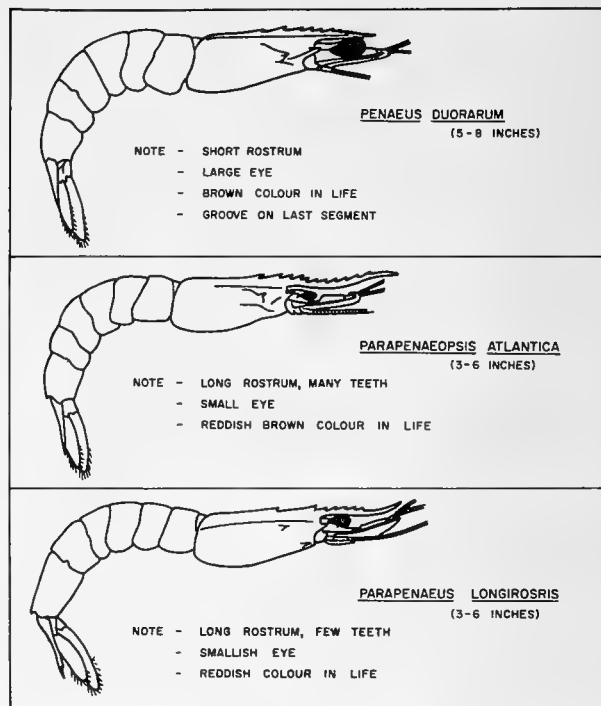


Fig. 3 - Outline drawings and characteristics of the three main species of commercially important shrimp in the eastern Gulf of Guinea; based on a figure in Crosnier 1964.

Table 1 - Catch Rate of Fish for Each Depth Interval and in Each Subarea During the 1963 <u>Kiara</u> Survey						
Fathoms	Areas					
	I	II	III	IV	V	VI
	(Kilograms Per Hour)					
0-10	43.7	60.5	64.7	132.1	77.6	20.2
10-20	116.1	35.7	69.0	50.5	125.2	7.0
20-30	36.6	34.8	211.0	48.6	24.0	1.0
30-40	14.0	73.5	12.3	45.0	16.4	1.0
40-50	-	-	-	35.0	-	1.0
> 50	-	12.3	39.9	-	-	-



expected from earlier surveys elsewhere on the tropical West African coastline (e.g., Postel 1955; Salzen 1958; Longhurst 1963), that two main fish faunas were present: in the tropical surface water above the thermocline, on muddy deposits, a fauna dominated by croaker, spade-fish, threadfin, grunter, catfish, and tonguesole; in colder water below the thermocline a fauna of reddish, rather small fish, dominated by bream, snapper, gurnard, flathead, and small horse mackerel. The greatest concentrations of shrimp were taken in the same hauls as the warm water, muddy deposit fish fauna, and those shrimp were entirely Penaeus duorarum and Parapenaeopsis atlantica along the entire coastline. Only very occasional specimens of Parapenaeus longirostris were taken, always with the deeper fish fauna.

Shrimp were taken in recordable quantities in all areas except in area I (table 2), which was predominantly sandy deposits to the west of Lagos.

The data (which are summarized from detailed station data in Anon. 1963 and Longhurst 1965b) illustrate the main characteristics of the shrimp resources: that catches are higher and shrimp easier to locate to the east of Lagos and are particularly abundant off the great Niger delta; that good catches are virtually restricted to relatively shallow depths above the thermocline and follow the same pattern of abundance as do the fish catches and fall off similarly below the thermocline; that the fish catches in the Bight of Biafra were relatively very small, as were the shrimp catches.

Area	Total No. of Stations	No. of Stations with Shrimp	Depth Range <sup>1</sup> (Fathoms)	Max. Catch Rate/Hour (Kilograms)
I	20	0	-	-
III	15	4	18-60 (30)	134
III	21	12	14-80 (21)	103
IV	19	10	14-41 (20)	501
V	17	3	19-40 (20)	86
VI	12	12	7-42 (12)	c. 100

<sup>1</sup>Figure in parentheses = depth of maximum catch.

## OBSERVATIONS

The few shrimp trawlers now fishing out of Lagos (Kaufmann, pers. comm.) have found commercial quantities of Penaeus duorarum and tonguesole (Cynoglossus canariensis) at about 20 fathoms and are landing greater quantities of that shrimp species than of P. atlantica. This is unlike the earlier trawlers which were generally fishing shallower depths (around 7-10 fathoms) in search of concentrations of croaker (that fish species follows the distribution of P. atlantica which forms a major part of its diet). The data from the Kiara survey summarized in this article indicates that such catches of P. duorarum will be found to extend at least 250 miles to the east, around the Niger delta; farther eastward, in the Bight of Biafra, the situation is not so clear and it is expected that much relatively unproductive mud in shallow depths will be encountered by the shrimp trawlers. At several stations in the Bight the Kiara had almost no catch of fish or shrimp for an hours' haul under satisfactory conditions, recalling much earlier reports of azoic mud in that region by the research vessel Cape St. Mary, probably due to the shallowness and permanence of the thermocline (Longhurst 1965b). The results (Williams, pers. comm.) of the Guinean Trawling Survey of C.C.T.A., recently completed, do not appear to confirm this poverty of catches in the Bight of Biafra, however, and the actual situation may be more complex than the above statement suggests.

Some further observations about the future fishery may be useful at this time of exploration and development. Oceanographic surveys off Nigeria completed by the Federal Fisheries Service in 1961-62 (Longhurst 1964) showed that there is very little seasonal fluctuation in the depth at which the thermocline occurs during a normal year off that coast and that consequently there is no strong likelihood that the depth at which the main population of Penaeus duorarum occurs will fluctuate during the year; the strong coastal upwelling off Ghana and Ivory Coast which would complicate this situation reaches Nigeria only in exceptional years and in any case hardly extends eastward of Lagos. It is known from Gulf of Mexico studies that Penaeus duorarum requires the presence of estuarine or lagoon systems in which the larvae settle, grow through the juvenile stages, and then as subadults return to the sea after perhaps 6 or 8 months of growth. In Nigeria, Penaeus duorarum juveniles are found in the lagoons behind Lagos, and in the Port Harcourt area (Sivalingham, pers. comm.) while Parapenaeopsis atlantica does not appear to enter those brackish waters--this suggests that concentrations of adult populations of P. duorarum may be expected off the entrances to such brackish-water areas during

the dry season (November to May) while heavy concentrations of subadults may be expected at the first flushing out of those areas with the onset of the rains in June and July.

### CONCLUSIONS

Thus, it seems certain that along much of the Nigerian coastline there exists a resource which, if properly managed, could form a valuable export trade for the country. The recent survey of West African shrimp by Monod (1964) and the recent trawling survey of the Cameroons continental shelf (Crosnier 1964) by the O.R.S.T.O.M.<sup>1/</sup> vessel Ombango (based in the Congo Republic) have shown that considerable resources of the same two species occur along the tropical West African coast from Senegal to the Congo wherever a muddy continental shelf and an extensive lagoon or estuarine exist.

Penaeus duorarum, which from its size will probably remain the prime commercial shrimp of the Gulf of Guinea, has been shown to occur in depths similar to those in which it is being found off Nigeria in a number of tropical West African localities: off Casamance, where a shrimp fishery is developing at Zinguinchor (Monod 1964); off Sierra Leone to the south of Freetown (Longhurst 1958); off the Ivory Coast, where the Abidjan trawlers land incidental quantities (Monod 1964); in the Cameroonian Republic sector of the Bight of Biafra, where Crosnier (1964) shows that Penaeus duorarum is abundant on muddy deposits at 20-30 fathoms; off the Congo mouth and as far south as the Angola border, Rossignol and Repelin (1962) show that the species is abundant between 20 and 25 fathoms, but suggest that during the annual coastal upwelling of cold water over the continental shelf in that area the species is forced to congregate much closer to the coast (as do related Penaeid shrimp in the Gulf of Panama under similar oceanographic conditions).

Unfortunately, the development of these shrimp resources will inevitably result in conflicts of interest with existing fisheries, at least off Nigeria; the fresh fish supplies for Lagos come primarily from the catches of the small fleet of trawlers operating on much the same grounds as the shrimp trawlers will be interested in, and it is to be feared that the activities of an enlarged fleet, working with fine-meshed trawls primarily for shrimp, will rapidly destroy the stock of demersal fish which is already heavily and dangerously exploited. It seems very probable that some form of legislation will be needed to conserve the fish stocks in the future. The canoe fishermen, already hard hit by the existing trawlers, have been seeking in recent years to fish grounds so far unused by the trawlers, and have been fishing to a much greater extent than formerly for the deep Cynoglossus canariensis on the 20-fathoms grounds off Lagos--and it is just those same grounds which appear to interest the shrimp trawlers most.

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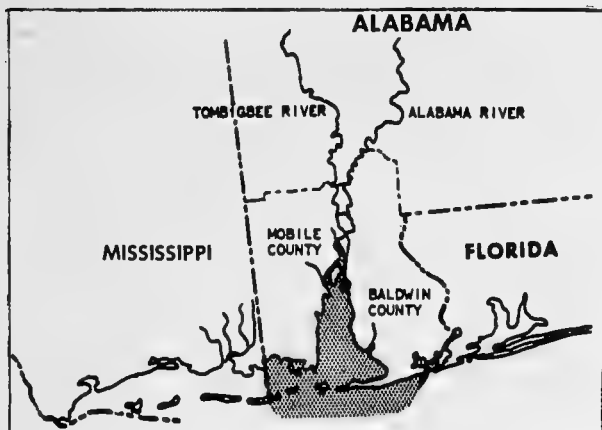


# TRENDS AND DEVELOPMENTS

## Alabama

### LANDINGS AND FISHERY TRENDS, 1964:

During 1964, fishery landings in the Alabama coastal area, including the Alabama-Tombigbee River system were 15.1 million pounds with a value of \$4.0 million--a gain of 1 percent in quantity and 7 percent in value as compared with 1963. Leading items in 1964 were shrimp (7.2 million pounds, heads-on weight), red snapper (2.4 million pounds), blue crab (1.8 million pounds), mullet (1.1 million pounds), and oysters (1.0 million pounds)--89 percent of the year's total was made up of those 5 varieties of fish and shellfish.



Marine landings concentrated in ports of Mobile and Baldwin Counties.

**Shrimp:** The 1964 shrimp landings of 7.2 million pounds (heads-on weight), valued at \$2.6 million, were down 7 percent in quantity, but up 9 percent in value from 1963. Brown shrimp made up 62 percent of the 1964 shrimp landings; white, 36 percent; and pink, 2 percent. Compared with the previous year, the catch of white shrimp in 1964 increased 24 percent while that of brown shrimp declined 19 percent. In late June 1964, Alabama ex-vessel shrimp prices began a gradual increase on all count sizes which continued through December.

**Oysters:** The 1964 oyster landings of 1.0 million pounds of meats valued at \$324,000

represented a slight increase in quantity but a small decline in value from 1963. Demand for shucked oysters was at about normal levels, although the usual price declines were noted during periods of peak production in 1964. The spring oyster harvest accounted for 79 percent of the total landings in 1964. The spring catches were made prior to fresh-water flooding and pollution that almost depleted the beds and reefs in the western areas of Mobile Bay and Alabama waters of the Mississippi Sound. Efforts were made by the Alabama Department of Conservation to improve those areas by planting seed oysters and shells obtained from other states. Reefs in the eastern portions of Mobile and Bon Secour Bays did not suffer extensive damage from the freshets and pollution.

**Crab:** Alabama fishermen landed approximately 1.8 million pounds of blue crab in 1964 valued at \$110,000. Compared to 1963, that was an increase of 36 percent in quantity and 48 percent in value. Crab processing firms operated 3 to 4 days per week during the spring and fall months and 5 to 6 days per week during the peak production period of the summer months. Larger firms trucked crabs from other states to meet demand during periods of low Alabama production. Prices to crab fishermen ranged from 7 cents to 10 cents a pound in 1964. The yield of crab meat from 100 pounds of live crab varied from 12 to 20 pounds of meats with an annual average of about 15 pounds. Steady market conditions prevailed for crab meat throughout the year.

**Finfish:** Landings of finfish (salt- and fresh-water) at Alabama ports during 1964 were 5.1 million pounds valued at \$910,000--an increase of about 5 percent in quantity and value from 1963. Red snapper was the leading item and accounted for 47 percent of the poundage and 75 percent of the value of total finfish landings in 1964. During the year new snapper vessels joined the fishing fleet, and new fishing grounds for snapper were discovered off the coast of Honduras. Black

Alabama Landings, 1964 and 1963				
Species	1964		1963	
Fish	Lbs.	\$	Lbs.	\$
Bluefish . . . . .	10,973	691	3,914	325
Buffalofish . . . .	67,695	6,937	63,485	6,643
Catfish . . . . .	45,253	11,421	44,008	11,018
Croaker . . . . .	3,195	271	46,635	3,152
Drum:				
Black . . . . .	17,312	1,429	10,423	639
Red or redfish . .	19,295	3,041	20,506	3,104
Flounders . . . . .	162,088	24,836	107,383	20,278
Groupers . . . . .	304,542	43,524	295,413	42,267
Jewfish . . . . .	118,450	11,747	41,420	3,817
King whiting or kingfish . . . . .	574,759	28,892	237,749	13,665
Mullet . . . . .	1,071,981	55,620	1,389,604	70,799
Paddlefish or spoonbill cat. . .	9,962	1,270	11,228	1,336
Pompano . . . . .	1,645	827	1,146	675
Sea catfish . . . .	12,801	684	5,926	327
Sea trout:				
Spotted . . . . .	64,601	16,472	53,640	13,536
White . . . . .	65,120	3,264	77,793	4,109
Sheepshead:				
Fresh-water . . .	15,401	2,319	14,809	1,945
Salt-water . . . .	34,711	2,374	14,442	956
Snapper, red . . .	2,392,875	685,133	2,314,891	663,422
Spanish mackerel .	74,139	8,358	38,977	3,549
Spot . . . . .	13,659	701	35,410	1,766
Other fish . . . .	485	34	2,561	286
Total fish . . . .	5,080,942	909,845	4,831,363	867,614
Shellfish				
Crabs, blue, hard	1,761,725	110,335	1,296,710	74,736
Shrimp, heads-on . . . . .	7,214,738	2,629,814	7,760,033	2,419,219
Oysters . . . . .	1,005,260	324,125	995,285	352,577
Squid . . . . .	4,168	350	4,047	309
Total shellfish . .	9,985,891	3,064,624	10,056,075	2,846,841
Grand total . . .	15,066,833	3,974,469	14,887,438	3,714,455
Note: Landings are round weight for all species except oysters which are pounds of meats (8.75 pounds per gallon).				

mullet continued as the next most important species despite a 23-percent decline in landings from 1963. That decline was offset by increased landings of flounder, grouper, jewfish, king whiting, and Spanish mackerel. Prices for most finfish species were about the same as in the previous year.

**General:** During 1964, the Alabama legislature adopted new regulations providing that shell oysters used for canning (hermetically sealed) have a minimum length of  $2\frac{3}{8}$  inches with a 25-percent allowance for undersize oysters; the minimum size for the fresh oyster trade was established as  $2\frac{7}{8}$  inches with an allowance of 5 percent for undersize oysters.

There were several changes in processing plants during the year. A fish stick producer located in Mobile Ala., transferred operations to the New England area. The only Alabama plant canning oysters and shrimp gave up that type of processing during the year.

Local shipyards were busy the entire year. Ten new vessels were constructed for local interests and several others for owners in other states. Of the 10 vessels joining the local fleet, 8 entered the shrimp fishery and 2 entered the snapper fishery.



## Alaska

### KING CRAB INDUSTRY BOARD NAMED BY GOVERNOR:

Alaska's Governor Egan appointed six crab industry leaders as board members under the newly passed King Crab Marketing and Quality Control Act. The 1965 Alaska Legislature created the board as an industry watchdog to maintain the quality of king crab produced in Alaska and to develop markets for the product. King crab processors are to be assessed on the basis of raw crab produced to pay the cost of the board's operations after 51 percent of the processors based on both number and quantity approve its program.

Two of the board members were appointed for 1-year terms, another two for 2-year terms, and the remaining two members were appointed for 3-year terms.

\*\*\*\*\*

### FOREIGN FISHING ACTIVITY OFF ALASKA, AUGUST 1965:

**U.S.S.R.:** The Soviet trawling fleets in the Gulf of Alaska during August 1965 concentrated their fishing activities along the 100-fathom curve between Cape Ommaney and Cape St. Elias. From the first to about the middle of August the major trawling efforts were centered from Cape Spencer to Cape St. Elias. During the first three weeks in August, a fleet made up of about 25 trawlers and 5 reefers fished in southeast Alaska off Baranof and Chichagof Islands. By the end of the month that fleet had diminished to about 6 trawlers and 1 reefer vessel.

The size of the Soviet fleet fishing in the eastern Gulf of Alaska from Cape Spencer to Cape St. Elias remained fairly stable. Some 70 trawlers, 16 reefers, and various support vessels operated in the area during August. Soviet catches in the Gulf of Alaska were predominantly Pacific ocean perch.



Fig. 1 - Older type Soviet side trawler operating in offshore waters off Alaska.

The Soviet fishery along the eastern and Central Aleutians continued throughout August. The fleet there consisted of about 15 trawlers (including 8 to 10 BMRT's), 3 reefers, and a few support vessels. This was a slight reduction compared with the previous month's Aleutian fleet in that area.



Fig. 2 - More modern type of Soviet trawler (SRT-M) operating in Gulf of Alaska.

In the western Aleutians a small fleet operated throughout August. It consisted of about 6 BMRT stern trawlers accompanied by a few reefers and support vessels.

Late in July it was estimated that 5 Soviet SRT-M trawlers were shrimp fishing near Lighthouse Rocks east of the Shumagin Islands. That fleet was down to 2 trawlers by the first week in August and remained at that level throughout the month.



Fig. 3 - Soviet fish factoryship about 150 feet long.

Three Soviet whaling fleets operated off Alaska during the month. The factoryship Vladivostok worked in the eastern, central, and western Gulf of Alaska and the Aleut and Dal'niy Vostok operated in the central and western Aleutians. Each whale factoryship was accompanied by about 9 whale killer vessels.

Japan: The Chichibu Maru and her 12 accompanying trawlers reportedly left the offshore waters off Alaska early in August and returned to Japan. A Japanese news article reported the Chichibu Maru was scheduled to sail from Hakodate, Japan, for the Bering Sea on or about August 30. She was to be accompanied by 8 trawlers of 260-ton capacity.



Fig. 4 - Japanese trawler fishing for mothership operating in offshore waters off Alaska.

The Japanese factory trawler Akebono Maru No. 71 returned to the waters off Alaska.



Fig. 5 - Japanese mothership operating in North Pacific and Bering Sea.

ka around the middle of August and fished in the vicinity of Amukta Pass in the central Aleutians for the rest of the month.

The factory trawlers Dainshin Maru No. 12 and Takachiko Maru continued fishing generally along the 100-fathom curve between Albatross Bank and the Middleton Island area. A third factory trawler, the Sumiyoshi Maru No. 12 was reported to have ended fishing operations early in August. The smaller Japanese trawlers Taiyo Maru No. 37, Fukuho Maru No. 2, and the Fukushin Maru No. 1 remained in the Gulf during August. They had been fishing the Albatross Bank region.



Fig. 6 - Catch of bottomfish on the deck of a Japanese trawler in North Pacific.

During August the three Japanese fish meal factoryships continued fishing in the area about 100 miles northwest of the Pribilof Islands. They were accompanied by a total of 65 trawlers.

The Japanese shrimp factoryship Einen Maru and her 15 trawlers continued to operate throughout August in the area 50 to 100 miles north of St. Paul Island.



Fig. 7 - A Japanese tangle-net setting trawler attached to king crab factoryship in Bering Sea.

The Japanese king crab factoryships Tokei Maru and Tainichi Maru, each accompanied by 5 tangle-net setting trawlers, operated in the Bering Sea about 100 miles northwest of Port Moller during the first half of August. The Tainichi Maru was reported scheduled to leave for Japan on or about August 14. Catches by the Tokei Maru had not been as good as those of the Tainichi Maru and she remained on the crab grounds until about the end of the month.



Fig. 8 - Japanese whale factoryship operating in waters off central and western Aleutian Islands.

In late August the Japanese whale factoryship Nichiei Maru and her 7 killer vessels reportedly were beyond Alaskan waters and it was assumed they had returned to Japan. The other two Japanese whaling fleets, each accompanied by 7 whale killers, continued operations in waters off central and western Aleutian Islands.

\* \* \* \* \*



**1965 HERRING FISHERY DOWN SHARPLY:**

The 1965 southeastern Alaska commercial herring operation, limited to Washington Bay, was yielding poor catches. By August 22, only 3,000 tons had been landed compared to 21,000 tons at the same date in 1964. The catch was composed of age V fish and older, with ages VII and VIII accounting for more than 40 percent. A strong incoming age class was not evident.

\* \* \* \* \*

**SALMON FISHING SEASON ABOUT OVER:**

The 1965 salmon season ended in August except for a few areas in southeastern Alaska where seiners, gill-netters, and trollers continued fishing a while longer.

**Alaska Fishery Investigations****PINK SHRIMP VERTICAL MIGRATIONS:**

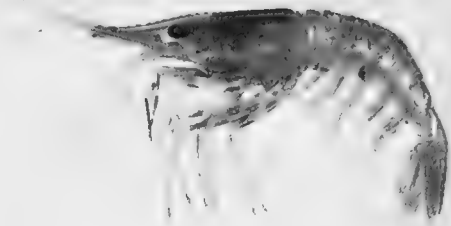
Vertical strings of pots pulled every 3 hours at the Kasitsna Bay station showed that in 50 fathoms of water the pink shrimp were at less than 12 fathoms off the bottom in mid-afternoon. But they occurred at all levels to the surface by midnight, with a maximum concentration at 12 fathoms below the surface. By 6 a.m. the shrimp had returned to less than 24 fathoms off the bottom.

\* \* \* \* \*

**SHRIMP LIFE HISTORY STUDIES:**

Alaskan pink shrimp (*Pandalus borealis*) change their sex from male to female. The reason for this is not known and there are other aspects of shrimp life history about which little is known. To learn more about the habits and movements of commercially important Alaskan shrimp, basic studies are being carried out by biologists of the U. S. Bureau of Commercial Fisheries Field Station at Kasitsna Bay near Homer, Alaska. Several species of shrimp--the pink, humpy, coon stripe, spot, and sidestripe--are being studied.

The studies have shown that young specimens of pink shrimp in Alaska are always male. Then when they are 4 years old in the North they become females, hatch their first brood of eggs and spend the rest of their lives as functioning members of that sex. When it



Spot Shrimp  
(*Pandalus platyceros*)

is time to change sex, the male parts atrophy and the female organs develop. Most of the change takes place in the spring of the year. However, pink shrimp in southern Alaska in the area of Petersburg, Wrangell, and Auke Bay change from males to females in their third year. Again the reason for this is not known. Scientists are trying to determine whether or not the pink shrimp females survive after producing one brood of young, and if so, whether they live to produce one or more subsequent broods.

The food chain of shrimp is not solved either. Their choice of food is not known at present.

It is known that Alaskan pink shrimp prefer a green mud bottom and a flat surface. However, the shrimp are not confined to the floor of the sea. They make nightly migrations to the surface. They are pelagic especially at night. When daylight hours approach, the shrimp head for the ocean depths again.

Life history and ecology studies on pink shrimp make up a new research program started by the U. S. Bureau of Commercial Fisheries 3 years ago. The research vessel *Sablefish* is being used in the shrimp investigations. An otter trawl is used for shrimp sampling. There are three sampling sites and each is sampled twice a month with pot and trawl gear.

In addition to the established sampling procedure, an effort is being made to locate the environment of postlarval, young-of-the-year pink shrimp which have not been taken in samples to date.

Vertical distributions and daily activity cycles of shrimp are also being studied.

Note: See Commercial Fisheries Review, May 1963 p. 18.

\* \* \* \* \*

#### KING CRAB STUDY REVEALS UNUSUAL "STACKING" BEHAVIOR OF JUVENILES:

Young king crab in the Bering Sea often stack up like hay in piles of thousands of individuals, according to shellfish biologists of the U. S. Bureau of Commercial Fisheries Biological Station at Auke Bay (Juneau) Alaska. They found one crab pod which was about 4 feet high and 8 feet in diameter. It contained some 2,000 juveniles.

"The stacking of the young king crabs is an odd bit of behavior which is not understood. They stack up at intervals, disperse, and stack up again," said the scientist in charge of the shellfish investigation. "This clumping or stacking of young crabs might be a protective mechanism since this crab congestion takes place in barren areas devoid of plant growth. It might also protect some of the crabs that are molting."

Observing juvenile king crab is an important part of growth and molting studies. It was not known until recently how often young king crab molt, or the age-class of adult king crab. The investigation will help explain the life history of this important commercial species about which little is known.

\* \* \* \* \*

#### SALMON EARBONES REVEAL AGE IN STUDY OF SOCKEYE RUN TO KARLUK LAKE:

It's a good thing salmon have ear bones. They not only serve the fish, of course, but also aid science by revealing the age of fish--valuable information to researchers of the U. S. Bureau of Commercial Fisheries Biological Laboratory at Auke Bay, Juneau, Alaska.

In making the age determination, the ear bone--which is smaller than a fingertip--is removed from the fish and placed under a low-powered microscope. Concentric white rings are readily seen. Those are counted. As one ring is laid down for each year of life, the number of rings reveals the age of the fish.

The age studies by biologists of the U. S. Bureau of Commercial Fisheries are part of

a research program to find reasons for the long-term decline in sockeye salmon spawning runs to Karluk Lake in Southeastern Alaska.

Note: See Commercial Fisheries Review, Sept. 1965 p. 19.



#### American Samoa

##### COMPOSITION OF TUNA FLEET OPERATING FROM AMERICAN SAMOA:

Tuna long-line vessels fishing out of American Samoa as of July 1, 1965, were reported to total 67, including 36 Japanese, 17 South Korean,



Fig. 1 - Setting long line aboard a Japanese tuna long-liner near American Samoa.

and 14 Formosan vessels. It was reported by Japanese trading firms that the number of South Korean and Formosan vessels fishing out of Samoa was steadily increasing and those ves-



Fig. 2 - Unloading tuna from a long-liner at American Samoa.

sels were able to compete with Japanese vessels since their wage scales were lower. (Suisan Keizai Shimbun, August 10, 1965.)

\* \* \* \* \*

**TRANSSHIPPING TUNA TO JAPAN:**

The Kanagawa Prefectural Tuna Fishermen's Cooperative Association in Japan has studied a plan which it hoped to implement in September 1965 whereby Japanese tuna vessels operating out of American Samoa will transfer tuna considered not suitable for canning and other species (such as spearfish and sharks) to a Japanese carrier vessel for shipment to Japan. The plan provides for a cargo vessel to call at American Samoa once a month to pick up the fish. The carrier firm's vessels presently call at such places as Tahiti, Fiji Islands, and Noumea (New Caledonia). (Katsuo-Maguro Tsushin, September 1, 1965.)

**California**
**MARINE RESEARCH CENTER  
BEING ESTABLISHED BY  
UNIVERSITY OF SOUTHERN CALIFORNIA:**

A major Marine Science Research Center is being established by the University of Southern California at Santa Catalina Island, 21 miles off the southern California mainland. The first unit of the Center will be a Marine Biology Laboratory. Plans call for construction of the laboratory to begin in the fall of 1965 and to be completed in late 1966. The Marine Biology Laboratory will provide the base for development of an extensive research complex.

The Center ultimately is to include research buildings, laboratories, and other facilities for both basic and applied research in various phases of marine science. Development plans envision the involvement of private industry, as well as Government, for long-range programs of research and development in marine science and engineering.

Through its Allan Hancock Foundation, the University of Southern California has assumed the prime responsibility for planning, developing, and operating the Center. Other universities and colleges in the area are cooperating actively and will participate in the programs. Support and cooperation has been sought and received from the University of California at Los Angeles, Riverside, and Irvine, the California Institute of Technology, Pomona College, Occidental College, and the California State College System. Each of those institutions has official-

ly designated members of a Scientific Advisory Committee which will counsel on teaching and research at the Center.

The cost of the first phase in the development of the Center will amount to nearly \$2 million with about half of that sum going for the initial research building. A \$500,000 grant toward this work has been made by the National Science Foundation. The University of Southern California will match that sum from private sources. The construction of access roads and of water, power, and sewage lines by private firms represents an additional contribution of nearly \$1 million.

The location of the Marine Science Research Center at Fisherman's Cove on the eastern side of Catalina is regarded as an excellent site for marine studies. Among its advantages are: (1) diversity and abundance of temperate and subtropical marine plants and animals; (2) freedom from water pollution; (3) excellent water clarity; (4) comfortable water temperatures and a climate favorable to year-round operations; and (5) immediate access to a great variety of both shallow and deep oceanic environments.

Close proximity of the Center to the educational, scientific, and industrial components of southern California further serve to qualify it as an ideal base for marine research. (News Bureau, University of Southern California.)

**Columbia River**
**COLUMBIA BASIN INTER-AGENCY  
COMMITTEE MEETS TO  
DISCUSS FISHERY RESOURCES:**

The Columbia Basin Inter-Agency Committee planned to meet in Seattle, Wash., October 6, 1965, to consider fishery resources of the Columbia. Plans called for discussions covering fish passage research, relationships of the Columbia River to the international fishery in the Pacific Ocean, fishery implications of Canadian water storage, and other topics.

The Columbia Basin Inter-Agency Committee is made up of representatives of seven Federal agencies and the Governors of Idaho, Montana, Nevada, Oregon, Utah, Washington, and Wyoming.



## Federal Purchases of Fishery Products

### FEDERAL SPECIFICATION PROPOSED FOR FRESH AND FROZEN SHUCKED RAW OYSTERS:

The U. S. Bureau of Commercial Fisheries has requested comments from the oyster industry on a proposed Federal Specification for Oysters--Raw, Shucked: Fresh (Chilled) and Frozen. Federal Specifications are designed to meet the requirements of Federal agencies for purchases of food products.

Copies of the proposed specification were distributed to the United States oyster industry for review and comments were to be submitted by September 30, 1965.

One feature of the proposed specification in regard to Military purchases is the inclusion of microbiological standards for market oysters as adopted at the 1964 Shellfish Sanitation Workshop of the U. S. Public Health Service. The Army has asked that those be used for their procurement.



## Great Lakes Fisheries Explorations and Gear Development

### LAKE MICHIGAN TRAWLING STUDIES CONTINUED:

M/V "Kaho" Cruise 28 (August 10-28, 1965): An 18-day exploratory fishing cruise in Green Bay and northern Lake Michigan by the U. S. Bureau of Commercial Fisheries research vessel Kaho was completed on August 28, 1965. The purpose of the explorations is to extend knowledge on the seasonal distribution, abundance, and availability to trawl fishing gear of important commercial fish stocks in the Great Lakes. This work is part of the Bureau's multidiscipline effort to help Great Lakes fishermen overcome problems associated with changes in fish populations and various economic setbacks.

Catches made during this cruise provided further evidence of large stocks of Lake Michigan fish which are now only partially fished. Good catches of alewife, a recent invader of Lake Michigan from the lower lakes, were obtained in Green Bay and Grand Traverse Bay. Up to 1,100 pounds per half-hour drag were caught in both areas. A good catch of 610 pounds of large chubs was made off Port

Inland. Green Bay yielded up to 520 pounds of smelt per drag. Catches of 460 and 350 pounds of sucker were made in Green Bay and Little Traverse Bay, respectively.

A total of 23,743 pounds of fish was caught in 39½ hours of fishing time during the cruise. A general breakdown by species comprising principal portions of the total catch is shown in table.

Species Composition of Total Catch Made by M/V <u>Kaho</u> During Cruise 28				
Species	Green Bay		Northern Lake Michigan	
	Pounds Caught	Percentage of Area Catch	Pounds Caught	Percentage of Area Catch
Alewife	10,970	80	3,964	39
Chub	24	-	3,878	39
Sculpin	-	-	821	8
Smelt	1,511	11	594	6
Sucker	1,025	8	503	5
Other	157	1	296	3
Total	13,687	100	10,056	100

A noteworthy sidelight of the cruise was the capture of 53 of the 1.3 million lake trout planted in northern Lake Michigan in summer 1965 under the Great Lakes Fishery Commission lake trout restoration program. The lake trout recaptures will be helpful in determining the survival, growth rates, and dispersal of the newly stocked fish.

FISHING OPERATIONS: A total of 80 drags was completed with a 52-foot (head-rope) fish trawl, 51 in the open lake, 22 in Green Bay, and 7 in Grand and Little Traverse Bays. All drags were of 30 minutes each except 4 which were ended early due to snags, rough bottom, or set fishing gear. Major trawl damage occurred when the net snagged at 10 and 35 fathoms off Ludington, Mich.

FISHING RESULTS IN NORTHERN LAKE MICHIGAN: Alewife were available in relatively small quantities at all of the open lake stations. The largest catch of 400 pounds was made off Beaver Island at 12 fathoms. No alewife at all were caught off Frankfort since rough bottom conditions prevent trawling at depths shallower than 25 fathoms. Alewife fishing was better in Grand Traverse Bay and Little Traverse Bay where 1,100 pounds and 450 pounds, respectively, were taken at 14 and 15 fathoms.

Chubs were caught in commercially significant quantities near Manistique where 610 pounds (160 pounds of No. 1 and jumbo size) were caught at 20 fathoms off Seul Choix Point. Other species caught in amounts of

100 pounds or more included sculpin, smelt, stickleback, and sucker. Of the small lake trout caught, 52 ranging in size from 5.0 to 8.3 inches, were taken in the open lake and the Traverse Bays at depths ranging from 10 to 35 fathoms.

Species other than alewife and chubs taken in northern Lake Michigan included, among others: sculpin, smelt, white sucker, and common whitefish.

**FISHING RESULTS IN GREEN BAY:** Alewife were taken in all of the 22 trawl drags in Green Bay accounting for 80 percent of the total catch. Catch rates ranged from 20 to 1,100 pounds and averaged 500 pounds a half hour. A total of 10,970 pounds was landed in 11 hours' effort with the most productive depths between 10 and 15 fathoms.

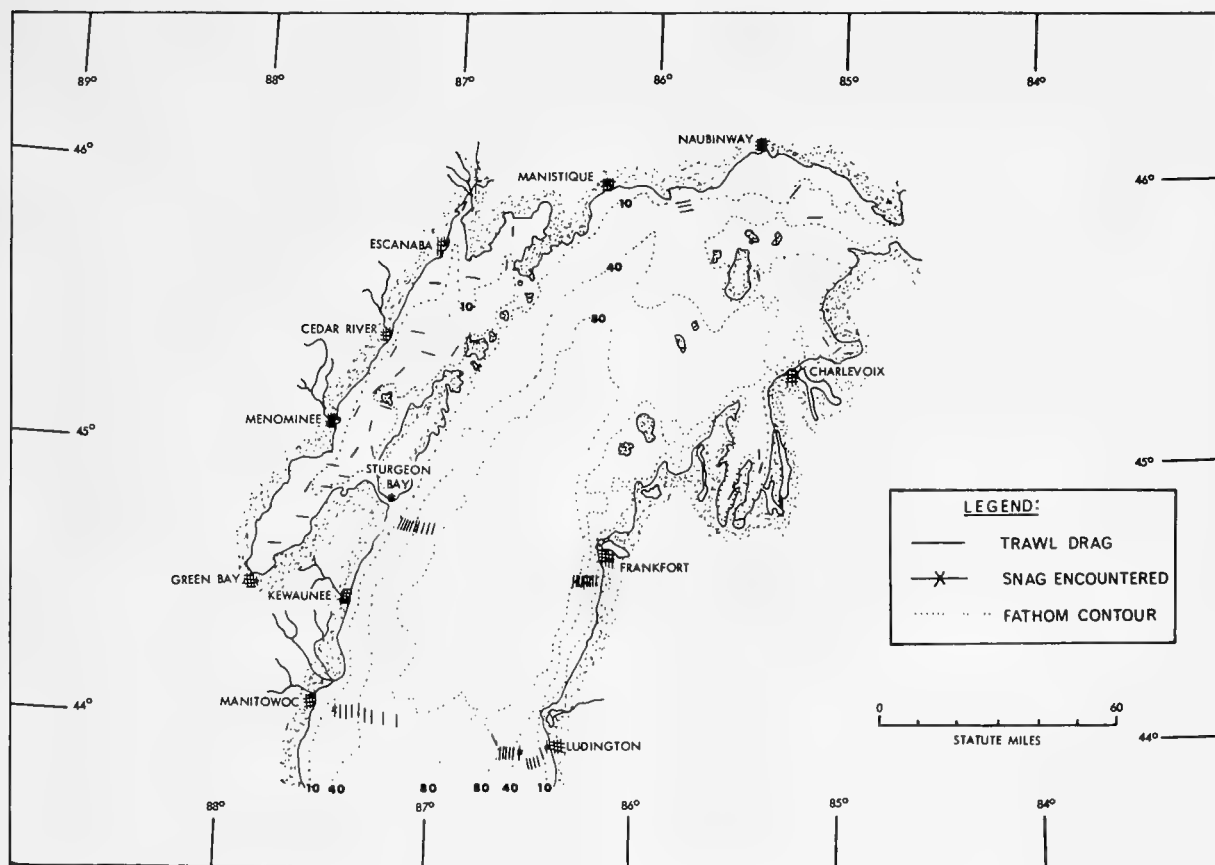
Smelt were the next most abundant species in Green Bay and comprised 11 percent of the total, or 1,511 pounds. They occurred in

17 of the drags in amounts from 2 to 520 pounds with an average catch of 90 pounds per drag. The best smelt catch was in 10 fathoms  $4\frac{1}{2}$  miles SE. of Pestingo Point.

Sucker were also caught in commercially significant amounts in Green Bay, particularly in the southern portion. Amounts up to 460 pounds per drag were landed with an average catch of 80 pounds for the 13 drags in which sucker occurred. A total of 1,025 pounds, or 8 percent, of the catch was sucker, of which 57 percent was white sucker and 43 percent longnose sucker. The best landing of 460 pounds was in 10 fathoms just south of Chambers Island.

Yellow perch occurred in 9 drags but in amounts up to only 20 pounds. One small fin-clipped lake trout was recovered in 22 fathoms near Washington Island.

Species other than alewife, smelt, and sucker in the Green Bay trawl catch included,



Northern Lake Michigan and Green Bay explorations by M/V Kaho Cruise 28 (August 10-28, 1965).

among others: yellow perch, common whitefish, burbot, chub, and cisco.

**OTHER DATA:** Surface water temperatures taken in Lake Michigan during the cruise ranged from 50° to 64° F. and in Green Bay from 65° to 69° F. Fishing (bottom) temperatures ranged from 37° to 53° F. in Lake Michigan and 46° to 69° F. in Green Bay.

Note: See Commercial Fisheries Review, September 1965 p. 27.



## Gulf Fishery Investigations

### SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-32 (August 10-21, 1965): Brown shrimp were predominant in the catches made during this cruise by the chartered research vessel Gus III of the U. S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex. As a result of offshore migrations from nursery areas during late spring and early summer, medium brown shrimp (41-50 count) were caught in larger numbers from depths of 11 to 40 fathoms in the entire survey area. White shrimp catches were very light.

As part of a continuing Gulf of Mexico shrimp distribution study, 8 statistical areas were covered and 33 standard 3-hour tows with a 45-foot flat trawl were made. Other cruise operations included 48 plankton tows, 49 bathythermograph (BT), and 177 water (Nansen bottle) casts. A total of 24 shell dredge and 17 bottom sediment samples were taken on the cruise to supplement data on ecologically associated organisms in connection with the commercial shrimp environment.

The largest catch of the cruise was made in area 16 for a total of 80 pounds from the three depth ranges worked. The over 20-fathom depth of that area yielded 63 pounds of 26-30 count brown shrimp and smaller quantities of brown and large white shrimp from up to 10-fathom depth.

Area 18 yielded 42 pounds of 41-50 count brown shrimp and 3 pounds of pink shrimp (31-40 count) from the 11-20 fathom depth range. The over 20-fathom depth of the same area yielded 8 pounds of large brown shrimp (12-15 count), and 5 pounds of brown and white shrimp was caught in depths up to 10 fathoms.

The over 20-fathom depth of area 13 yielded 26 pounds of 31-40 count brown shrimp. Other depths in the same area accounted for 10 pounds of very small brown shrimp and a few pounds of 15-20 count white shrimp.

Although white shrimp catches were quite small in all areas worked, they almost consistently ran to large sizes (15-20 count), mostly from the up to 10-fathom depth range. Pink shrimp taken on the cruise was from three areas--mostly 31-40 count.

The vessel also occupied the third in a series of 24-hour current measurement stations in 8 fathoms of water south of Morgan City, La.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.

(2) See Commercial Fisheries Review, September 1965 p. 29.

(3) Following completion of cruise GUS-30 during June in Gulf of Mexico offshore waters, the Gus III was used to carry out other types of work (Cruise GUS-31). The work included studies of the selective characteristics of the cod end of shrimp nets, comparisons of the relative fishing power of the Gus III and commercial shrimp trawlers, and shrimp staining experiments. The results of that work are to be analyzed. The comparative studies showed that the average catch of shrimp by the Gus III was similar to that of 40 commercial vessels fishing in the same area.



## Gulf and Atlantic States

### Marine Fisheries Commissions

#### JOINT ANNUAL MEETING IN MIAMI, FLA.:

The Sixteenth Annual Meeting of the Gulf States Marine Fisheries Commission was held in joint session with the Atlantic States Marine Fisheries Commission at Miami, Fla., October 6-8, 1965.

The opening joint general session on October 6 included an address by Under Secretary John A. Carver, Jr., U. S. Department of the Interior. The Executive Director of the National Fisheries Institute gave an address entitled, "Fish and Seafood--A Kickoff to Profit."

Other subjects presented during talks and discussions at the general sessions included: "Glamourize and Merchandise," "Economic Analysis and Business Decisions in the Commercial Fishing Industry," "Fish Protein Concentrate," "Automation of Oyster Shucking," "Pesticide Research and Control Programs--USPHS," "Positive Thinking in Marine Fish-



ery Management," and "Commercial Fisheries Research and Development Act of 1964."



## Industrial Fishery Products

### U. S. FISH MEAL, OIL, AND SOLUBLES:

Production by Areas, August 1965: Preliminary data on U. S. production of fish meal, oil, and solubles for August 1965 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

U.S. Production 1/ of Fish Meal, Oil, and Solubles, August 1965 (Preliminary) with Comparisons			
Area	Meal Short Tons	Oil 1,000 Pounds	Solubles Short Tons
<b>August 1965:</b>			
East & Gulf Coasts. . . . .	34,853	31,511	17,342
West Coast 2/. . . . .	2,494	1,839	-
<b>Total. . . . .</b>	<b>37,347</b>	<b>33,350</b>	<b>17,342</b>
<b>Jan.-Aug. 1965:</b>			
<b>Total. . . . .</b>	<b>173,831</b>	<b>148,198</b>	<b>70,038</b>
<b>Jan.-Aug. 1964:</b>			
<b>Total. . . . .</b>	<b>175,360</b>	<b>140,766</b>	<b>71,707</b>

1/Does not include crab meal, shrimp meal, and liver oils.

2/Includes American Samoa and Puerto Rico.

\* \* \* \* \*

Production, July 1965: During July 1965, a total of 48,462 tons of fish meal and 40.6

U. S. Production of Fish Meal, Oil, and Solubles, July 1965 <sup>1/</sup> with Comparisons					
Product	July		Jan.-July		Total 1964
	1/1965	1964	1/1965	1964	
Fish Meal and Scrap:	(Short Tons) . . . . .				
Herring . . . . .	4,317	3,317	6,710	4,960	8,881
Menhaden 2/. . . . .	38,546	34,018	103,022	99,448	160,349
Tuna and mackerel . . . . .	2,855	2,344	14,252	11,176	21,113
Unclassified. . . . .	2,744	5,497	12,500	26,243	34,809
Total . . . . .	48,462	45,176	136,484	141,827	225,152
Shellfish, marine-animal meal and scrap . . . .	3/	3/	3/	3/	10,100
Grand total meal and scrap . . . . .	3/	3/	3/	3/	235,252
Fish solubles:	(1,000 Lbs.) . . . . .				
Menhaden . . . . .	16,184	15,774	41,256	42,362	68,738
Other . . . . .	2,340	2,240	11,440	14,677	24,558
Total . . . . .	18,524	18,014	52,696	57,039	93,296
Oil, body:	(1,000 Lbs.) . . . . .				
Herring . . . . .	3,242	3,716	4,255	5,937	10,354
Menhaden 2/. . . . .	35,554	28,183	105,474	99,325	157,730
Tuna and mackerel . .	623	479	2,307	1,987	4,816
Other (including whale)	56	1,400	2,812	5,153	7,298
Total oil. . . . .	40,575	33,778	114,848	112,402	180,198

<sup>1/</sup>Preliminary data.  
<sup>2/</sup>Includes a small quantity of thread herring.  
<sup>3/</sup>Not available on a monthly basis.

1/Preliminary data.

2/Includes a small quantity of thread herring.

3/Not available on a monthly basis.

million pounds of marine-animal oil was produced in the United States. Compared with July 1964 this was an increase of 3,286 tons of fish meal and about 6.8 million pounds of marine-animal oil. Fish solubles production amounted to 18,524 tons--an increase of 510 tons as compared with July 1964.

\* \* \* \* \*

Major Indicators for U. S. Supply, July 1965: United States production of fish meal and fish oil in July 1965 was higher by 7.3 and 20.1 percent, respectively, as compared with July 1964. Production of fish solubles was higher by 2.8 percent.

Major Indicators for U. S. Supply of Fish Meal, Solubles, and Oil, July 1965					
Item and Period	1/1965	1964	1963	1962	1961
<b>Fish Meal:</b>	(Short Tons) . . . . .				
<b>Production:</b>					
July	48,462	45,176	38,492	55,602	63,435
Jan.-July 2/	136,484	141,827	129,544	177,438	165,937
Year 3/	-	235,252	255,907	312,259	311,265
<b>Imports:</b>					
July	18,693	28,863	43,223	25,857	18,710
Jan.-July	228,551	285,292	225,157	166,743	126,536
Year	-	439,143	376,321	252,307	217,845
<b>Fish Solubles 4/:</b>					
<b>Production:</b>					
July	18,524	18,014	17,709	22,207	22,589
Jan.-July 2/	52,696	57,039	60,534	73,714	62,789
Year	-	93,926	107,402	124,649	112,254
<b>Imports:</b>					
July	123	1,506	330	306	708
Jan.-July	3,357	3,557	2,769	4,596	1,927
Year	-	4,505	7,112	6,308	6,739
<b>Fish Oils:</b>	(1,000 Lbs.) . . . . .				
<b>Production:</b>					
July	40,575	33,778	28,990	47,695	57,239
Jan.-July 2/	114,848	112,402	98,579	143,317	146,264
Year	-	180,198	185,827	250,075	258,118
<b>Exports:</b>					
July	16,145	40,449	29,343	128	4,421
Jan.-July	46,315	96,588	127,149	63,133	72,549
Year	-	151,469	262,342	123,050	122,486

1/Preliminary.

2/Data for 1965 based on reports which accounted for the following percentage of production in 1964: Fish meal, 89 percent; solubles, 89 percent; and fish oils, 99 percent.

3/Small amounts (10,000 to 25,000 tons) of shellfish and marine animal meal and scrap not reported monthly are included in annual totals.

4/No homogenized fish was produced in 1964 or during the first 7 months of 1965.

\* \* \* \* \*

### U. S. FISH MEAL AND SOLUBLES:

Production and Imports, January-July 1965: Based on domestic production and imports, the United States available supply of fish meal for the first 7 months in 1965 amounted to 365,035 short tons--62,084 tons (or 14.5 per-

U. S. Supply of Fish Meal and Solubles, January-July 1965			
Item	Jan.-July		Total 1964
	1/1965	1964	
	. . . (Short Tons) . . .		
<b>Fish Meal and Scrap:</b>			
<b>Domestic production:</b>			
Menhaden . . . . .	103,022	99,448	160,349
Tuna and mackerel . . . . .	14,252	11,176	21,113
Herring . . . . .	6,710	4,960	8,881
Other . . . . .	12,500	26,243	44,252
<b>Total production . . . . .</b>	<b>136,484</b>	<b>141,827</b>	<b>235,252</b>
<b>Imports:</b>			
Canada . . . . .	24,906	34,509	54,769
Peru . . . . .	192,921	227,325	348,025
Chile . . . . .	5,128	10,587	12,942
Norway . . . . .	25	-	-
So. Africa Rep. . . . .	1,900	10,738	18,581
Other countries . . . . .	3,671	2,133	4,826
<b>Total imports . . . . .</b>	<b>228,551</b>	<b>285,292</b>	<b>439,143</b>
<b>Available fish meal supply. . .</b>	<b>365,035</b>	<b>427,119</b>	<b>674,395</b>
<b>Fish Solubles:</b>			
<b>Domestic production 2/. . . .</b>	<b>52,696</b>	<b>57,039</b>	<b>93,296</b>
<b>Imports:</b>			
Canada . . . . .	1,006	1,162	1,553
So. Africa Rep. . . . .	-	860	987
Other countries . . . . .	2,347	1,535	1,965
<b>Total imports . . . . .</b>	<b>3,353</b>	<b>3,557</b>	<b>4,505</b>
<b>Available fish solubles supply</b>	<b>56,049</b>	<b>60,596</b>	<b>97,801</b>
1/Preliminary.			
2/50-percent solids.			

cent) less than during the same period in 1964. Domestic production was 5,343 tons (or 3.8 percent) less, and imports were 56,741 tons (or 19.9 percent) lower than in January-July 1964. Peru continued to lead other countries with shipments of 192,921 tons.

The United States supply of fish solubles during January-July 1965 amounted to 56,049 tons--a decrease of 7.5 percent as compared with the same period in 1964. Domestic production dropped 7.6 percent and imports of fish solubles decreased 5.7 percent.



## Inland Fisheries Explorations and Gear Development

### OAHE RESERVOIR TRAWLING STUDIES:

Reservoir Research Vessel "Hiodon"  
Cruise 1 (July 14-22, 1965): To delineate areas suitable for bottom trawling, test the effectiveness of commercial trawls as fishing gear, and collect catch and biological data were the specific objectives of this cruise in the upper one-third of Oahe Reservoir. This 8-day exploratory trawling operation by the new reservoir fishery research vessel Hiodon of the U. S. Bureau of Com-

mercial Fisheries was completed on July 22, 1965. Tows were made between reservoir miles 122 and 183 of the Reservoir in South and North Dakota.

Fish catches were low in most areas fished. Nineteen species of fish were taken but crappie, yellow perch, carp, drum, and shovelnose sturgeon dominated the catches. No species or sizes of fish were taken that normally are marketed by the existing commercial fisheries.



New reservoir exploratory fishing vessel Hiodon. Leaving the Kalamazoo River pier near Saugatuck, Mich., in mid-April 1965 to begin her 2,000-mile trip by lake, river, and highway to Oahe Reservoir--one of the largest Missouri River impoundments.

**FISHING OPERATIONS:** A total of 8 tows was made with a 55-foot (headrope length) Gulf of Mexico-type fish trawl and 14 tows were made with a 35-foot trawl of similar design. Mesh size (extended measure) of the cod end of the 55-foot trawl was  $1\frac{1}{4}$  inches and  $\frac{1}{2}$  inch in the 35-foot trawl. Nineteen tows were made over the old river channel and 3 tows were made over inundated bottomlands. Depths trawled ranged from 12 to 48 feet. All tows were 15 minutes each except 5 which were ended when the net became fouled on bottom obstructions. Bottom topography and depths were recorded continuously with a high resolution "white line"-type depth-recorder.

**FISHING RESULTS:** The total catch in 22 tows was 1,394 fish weighing 700 pounds. The average catch per tow was 31.7 pounds. The number of tows with catches of the most common fish were: 17 with carp; 13 with shovelnose sturgeon and fresh-water drum; and 11 with yellow perch. Highest catches per tow for tows catching fish were crappie 10.6 pounds, carpsucker 10.3, carp 9.5, shovelnose sturgeon 6.2, and drum 5.3 pounds.

The 35-foot trawl caught 44.4 pounds of fish per tow and the 55-foot trawl took 7.7

pounds per tow. Tows overinundated bottomlands caught fish at much higher rates than over the older river channel.

The cruise was beset with a number of operational difficulties which were encountered during the cruise. Difficulties were in the slow speed at which the 55-foot trawl was towed and pulled to the boat at the completion of each tow. The difference in the catch of the two sizes of trawl may have been due to the difficulty in towing and pulling in the 55-foot trawl at fast speeds--a problem less serious with the 35-foot trawl. The vessel returned early to Mobridge to make some minor engine adjustments.

Two trawls were badly torn during the cruise. Trawls frequently picked up large quantities of organic debris, bushes, logs, and on several occasions, large free-floating trees. Tows over carefully selected bottomlands yielded greater catches and less debris than tows over the old river channels. Continued trawling throughout the reservoir is certain to establish conditions for best fishing results and awareness of operational problems.

**OTHER DATA:** Hydrographic data collected showed that surface waters were progressively warmer and secchi disc readings higher from reservoir mile 183 to reservoir mile 122. Surface water temperatures ranged from 65° F. to 77° F., and secchi disc readings ranged from 2 to 10 feet.

**Reservoir Research Vessel "Hiodon" Cruise 3 (August 24-September 1, 1965):** This later cruise by the Hiodon in the Oahe Reservoir, between reservoir miles 122 and 131, ended early because of severe trawl damage caused by submerged free-floating trees.

**FISHING OPERATIONS:** The trawls used during the cruise were the same as those used on the earlier cruises. Only 7 complete 15-minute tows were made with the 35-foot trawl and 2 tows with the 55-foot trawl. Depths trawled ranged from 18 to 48 feet. Eight tows were made over old fields and one over the old river channel.

**FISHING RESULTS:** The total catch of the 35-foot trawl consisted of 1,078 fish (older than age group II) weighing 703 pounds. The average catch per tow was 154 fish weighing 100 pounds. Single catches ranged from 9.6 to 180.8 pounds. The average catch (in pounds)

of each species per tow was: carp 62.9; carp-sucker 12.3; perch 7.0; channel catfish 3.6; drum 3.4; northern pike 3.2; and 12 other species 8.0 pounds. The average individual fish weight (in pounds) of several species was: carp 1.6; carpsucker 1.5; yellow perch 0.1; channel catfish 0.4; northern pike 4.5; drum 0.4; and smallmouth buffalo 1.1.

Only 9 yearling fish were caught in the 35-foot trawl. The most abundant young-of-the-year fish taken were black bullhead, yellow perch, white bass, crappie, and drum. The two 15-minute tows made with the 55-foot trawl yielded 309 fish weighing 419.6 pounds. Average per tow was 154 fish and 210 pounds. Carp made up 83.4 percent of the catch by weight. The carp averaged 1.8 pounds in weight--mostly fish of the 1962 year-class.

Trawl catches on this cruise ranged from 9.6 to 211.7 pounds and averaged 124.7 pounds. Carp made up 70 percent of the total catch. Although a number of factors affect the rate of catch, the amount of debris on the bottom in many areas greatly reduces the catch. Apparently water currents move toward and down the old Missouri River channel which results in the deposition of organic materials on the bottom of these seemingly prime trawling areas. Bushes, shreds of cottonwood tree bark, twigs, and grass often are picked up by the trawl in such quantity that the open face of the cod end of the trawl may be completely choked with bushels of debris. The problem is less serious over old bottomlands and least serious over newly inundated pasture land. That tows are sometimes made over old haystacks and manure piles, or through barbed wire fences is evident when the trawls are pulled aboard. Submerged free-floating trees may be found anywhere and may shift location daily.

Charts are used to locate and delineate the various bottomlands, pastures, forested areas, and old river channel. The depth-finder is used over probable trawling areas to define depths, contours, and area that may be trawled. Free-floating submerged trees and bushy areas usually cannot be detected on the depth-recorder.

Note: See Commercial Fisheries Review, August 1965 p. 42.



## Marketing

### FISH 'N' SEAFOOD PARADE:

During October 1965 the fishery industry conducted an intensive advertising and publicity campaign and provided point-of-purchase material to acquaint food buyers with benefits of serving fish and seafoods.

As part of the fall promotional program, the U. S. Bureau of Commercial Fisheries provided various information media materials emphasizing ease of preparation, versatility, and nutritional value of fishery products.

The Bureau's director said, "Continuing research to improve methods of refrigeration and transportation is making high quality fish and seafood products available to more people than ever before. Americans are extremely interested in the nutritional values of food today and it has long been known that fishery products are excellent sources of protein, minerals, and essential B-complex vitamins."

The Department of Agriculture listed "Fish 'n' Seafood Parade" as a merchandising opportunity on a national basis in its October plentiful food literature.

This was the 12th successive year of the national fall promotion program.



## Michigan

### CHANGES IN GREAT LAKES COMMERCIAL FISHING REGULATIONS APPROVED:

Several changes proposed earlier in Michigan's Great Lakes commercial fishing regulations were approved in August 1965 by that State's Conservation Commission. One of the changes closed commercial fishing for lake trout in Lake Michigan as of October 1, 1965. The closure was timed to protect 1.2 million yearling lake trout planted in Lake Michigan in June 1965.

The same restriction has been in effect for several years in Lake Superior where the lake trout restoration program has made its greatest gains since the start of lamprey control and fish plantings in the late 1950's.

Another action taken by the Commission at its meeting in August is a November 1-30 closed season on whitefish in Lakes Michigan, Huron, and Superior to protect the fish from commercial fishermen during their peak spawning period in those waters. Closed seasons for taking whitefish by commercial netting have previously run from October 15 through December 10 in Lakes Michigan and Huron, and from November 1-26 in Lake Superior.

Another measure approved by the Commission will lift the depth restriction on using trap and pound nets to take lake trout and whitefish in those three lakes. Commercial fishermen operating in those waters have for years not been allowed to set impounding nets in waters deeper than 80 feet for catching either kind of fish.

The final change adopted by the Commission will remove the minimum size limit on yellow perch in Lake Erie.

All of these commercial fishing changes became effective on October 1, 1965. (*News Bulletin*, Michigan Department of Conservation, August 19, 1965.)

Note: See *Commercial Fisheries Review*, August 1965 p. 37.



## National Fish and Wildlife Library

### NEW REFERENCE SERVICE TO AID RESEARCH:

The establishment of a national fish and wildlife library reference service was announced September 16, 1965, by the Assistant Secretary of the Interior for Fish and Wildlife and Parks. The new reference facility, developed in cooperation with the International Association of Game, Fish and Conservation Commissioners, will serve State fish and game departments through the Interior Department Library in Washington, D. C., and the Denver Public Library in Colorado.

The reference program is designed to help fish and wildlife research workers on State conservation agency projects partially financed under the Federal Aid in Fish and Wildlife Restoration Acts. Each State, as well as Guam, Puerto Rico, and the Virgin

Islands, participates in the Federal Aid programs administered by the Interior Department's Bureau of Sport Fisheries and Wildlife. Financing of the library reference service will come from the Federal Aid funds prior to their apportionment to the States.

The Director of Interior's Bureau of Sport Fisheries and Wildlife said reference materials will be so organized that a single request will automatically receive attention from both the Denver Public Library, where all unpublished reports are to be housed, and the Library of the Department of the Interior, where publications will be kept. He said, "Establishment of the national fish and wildlife library reference service will provide, for the first time, a convenient means for research biologists to obtain specialized reference materials. Use of research findings of the past will improve coordination and avoid possible duplication of effort. I urge all State and Federal fish and wildlife workers to take full advantage of this new research facility."



## New Jersey

### ARTIFICIAL "SEAWEED" USED IN COASTAL EROSION-PREVENTION TESTS:

In the summer of 1965, New Jersey announced plans to test plastic ("polypropylene") strings as artificial "seaweed" in an effort to prevent coastal erosion. The tests were to begin in early August 1965 off Lookout Tower at Island Beach State Park in New Jersey. It was hoped that the artificial seaweed would help hold sandy ocean bottoms together and control currents and waves, thereby protecting the shoreline. New Jersey has no natural seaweed beds.

An oil firm supplied materials for the test to the New Jersey State Department of Conservation and Economic Development. That agency built a grid, 90 by 900 feet, containing clusters of the artificial material spaced 3 feet apart. Two types of polypropylene seaweed were to be tested. Half of the grid contained fronds of slit polypropylene film, the other half contained polypropylene monofilament.

The grid was to be planted with a specially designed anchoring formation 800 feet offshore, parallel to the coastline, in 15 feet of water. About 12 tons of lead weights will keep it from floating away.

A 2-year study of the artificial seaweed grid is planned by New Jersey. A log of weather in the area will be kept and periodic soundings and bottom samples will be taken.

The first artificial seaweed test took place on a limited scale 2 years ago in Denmark, when fronds of polypropylene film were planted in a 40-square-meter grid in the Thyboren Channel. During that test it was found that sand accumulated on the channel floor behind and in the grid, within an area of approximately 500 feet from the planting.

More extensive tests have since been initiated in Denmark and England. (Oil, Paint, and Drug Reporter, August 2, 1965.)

The British experiment with artificial ("polypropylene") seaweed is being conducted at Bournemouth, England, and is expected to continue into 1966. As in the Danish and New Jersey tests, the object of the British experiment is to prevent erosion by trapping and building up sand offshore, according to News Scientist, July 29, 1965. That periodical said two theories have been advanced to explain the trapping action. One is that the seaweed reduces shear stress on the submerged shore by concentrating it within itself; the other is that it slightly reduces the orbital velocity of sand particles as they describe ellipses due to the motion of the waves. If the first theory is correct, seaweed should be equally effective both in regions of steady current and in those having alternating wave motion; if the second is correct, it should have no effect in steady currents. It is hoped that the British tests will indicate which mechanism predominates.

Note: See Commercial Fisheries Review, Oct. 1964 p. 56.



## North Atlantic Fisheries Explorations and Gear Development

### TUNA AND SWORDFISH DISTRIBUTION STUDIES IN NORTHWEST ATLANTIC CONTINUED:

M/V "Delaware" Cruise 65-7 (July 23-August 5, 1965): Survey of the seasonal distribution and abundance of tuna and swordfish in the Northwest Atlantic, using long-line sampling gear, was continued during this two-week cruise by the U. S. Bureau of Com-

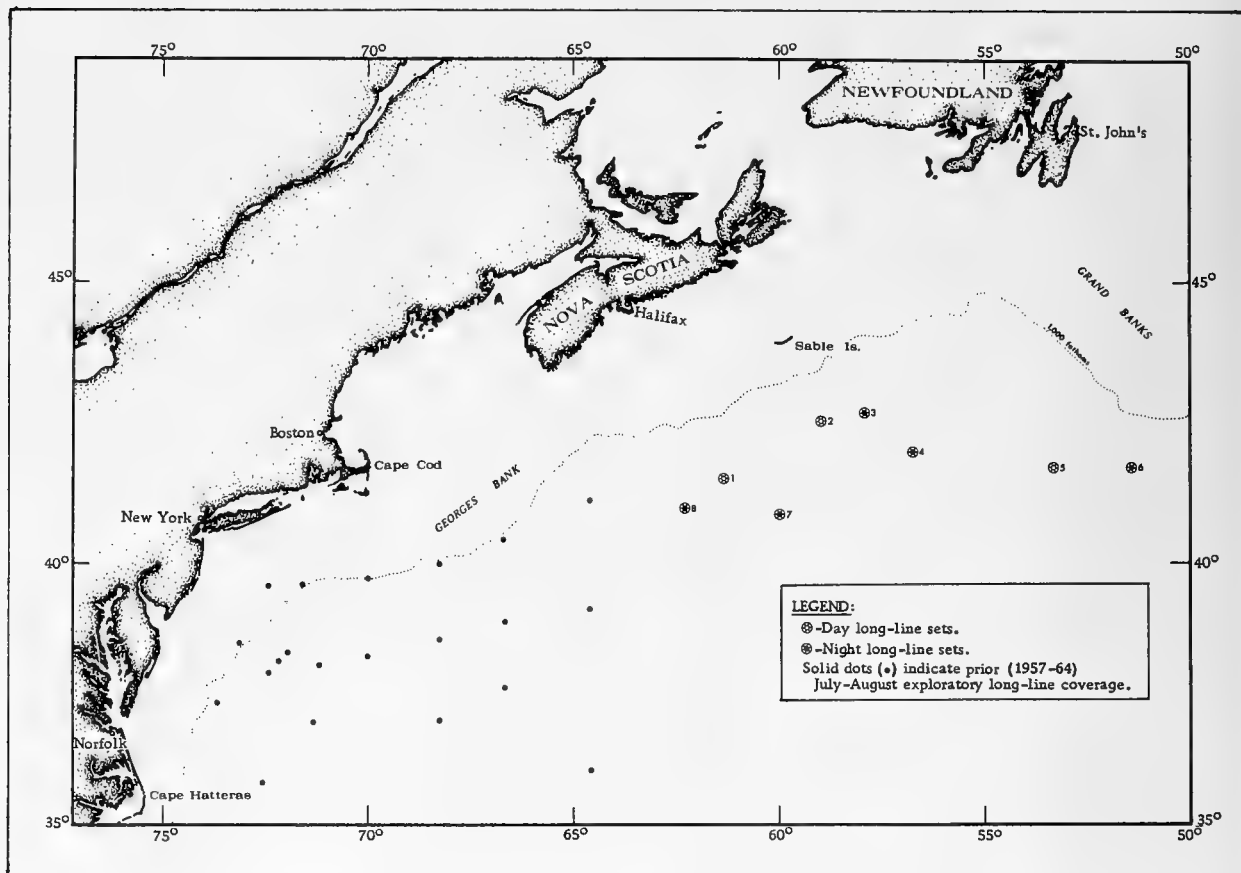


Fig. 1 - Station pattern of M/V Delaware Cruise 65-7 (July 23-August 5, 1965).

mercial Fisheries exploratory fishing vessel Delaware. It was the 15th exploratory long-line cruise for the vessel since spring 1957 to investigate latent pelagic fish resources in oceanic areas. Previous exploratory coverage during July-August in oceanic (over 100 fathoms depth) waters north of 35 degrees North Latitude has totaled 21 long-line sets made in the western portion, west of 64 degrees West Longitude.

**LONG-LINE SETS AND CATCH:** Three sets of long-line gear were made during daylight hours, and 5 sets were made at night, with a total of 4,600 hooks fished. Hooks baited with squid and herring were spaced at 20-fathom intervals and fished at estimated depths varying from 15 to 35 fathoms. A 600-hook set covered a horizontal distance of approximately 13 nautical miles.

Tuna and swordfish catches in the area surveyed were minimal. Albacore (Thunnus

alalunga) were taken at four stations with a maximum catch rate of 0.5 fish per 100 hooks at one of the stations. Average round weight of albacore tuna caught was 41 pounds and the range was 33 to 56 pounds. Four of the stations covered yielded big-eyed tuna (Thunnus obesus) with a maximum catch rate of 0.3 fish per 100 hooks at two stations. Average round weight of big-eyed tuna was 93 pounds and the range was 16 $\frac{3}{4}$  to 170 pounds. The 16 $\frac{3}{4}$ -pound specimen is believed to be one of the smallest of that species taken in the western North Atlantic. A single yellow-fin tuna (Thunnus albacares) weighing 14 $\frac{1}{4}$  pounds was taken at one of the stations.

Swordfish (Xiphias gladius) were caught at three night stations, with a maximum catch rate of 0.3 fish per 100 hooks at one of the three stations. Average round weight was 111 pounds and the range was 60 to 160 pounds. The 2 smaller fish were male (60 and 88 pounds) and the larger 2 were female (134 and 160 pounds).





Fig. 2 - Long-line gear on M/V Delaware is set at night from the port-quarter deck. Baited branchlines (5-fathoms) are clipped on the mainline at 20-fathom intervals. Note hinged cover of tub which opens as a bait tray. Hooks and baits (squid and herring) are separated by metal dividers to prevent snarls.

Other long-line catches of particular note were: 4 white marlin (Tetrapturus albidus), 1 pelagic stingray (Dasyatis violacca), and 1 gempylid (Lepidocybium flavo-brunneum).

**THERMAL ENVIRONMENT:** While survey of the geographical area was the primary mission of the cruise, attention also was given in selection of working locations within thermal environments most conducive to pelagic fish occurrence. This was accomplished through application of synoptic sea surface temperature information, received by radiofacsimile equipment aboard the vessel, and augmented by vertical (subsurface) water temperature profile data obtained from bathythermograph (BT) casts on location. Fishing results, therefore, suggest that within the geographic area worked, under observed thermal environment conditions, three species of tuna, and swordfish, were available in very small numbers to the gear fished.

**LONG-LINE GEAR OPERATIONS:** Changes and improvements in handling of long-line gear and deployment of deck personnel permitted a reduction of manpower requirements with no loss in operating time or efficiency. Four men on deck set and hauled long-line gear at the same rate previously requiring 6 men.

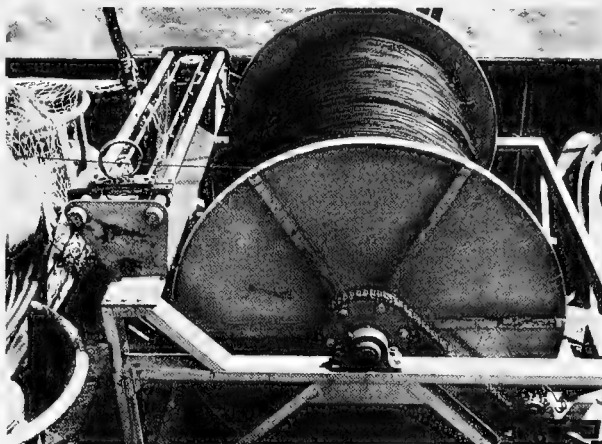


Fig. 3 - A hydraulic long-line reel used during M/V Delaware cruise carried 20 miles of  $\frac{1}{4}$ -inch mainline spooled by an automatic levelwind.

Earlier improvements have been reported from two previous cruises by the vessel Delaware. Among the modifications during this cruise were: (1) shift of the setout operation aft to the port-quarter rail, (2) reduction in number of 5-fathom coiled branchlines in tubs from 50 to 30, (3) separation of baited hooks, and (4) triple fairleading of the mainline from the hydraulic reel overboard to control line vibration. Further changes to the gear are anticipated during subsequent cruises. Replacement of hand-operated clips with a mechanical device to attach and detach branchlines to the mainline is expected to further reduce setting and hauling rates.

**OTHER ACCOMPLISHMENTS AND OBSERVATIONS:** In cooperation with the tuna-tagging program at Woods Hole Oceanographic Institution and the shark-tagging program of the Shark Research Panel, American Institute of Biological Sciences, a single big-eyed tuna and 24 sharks of assorted species were marked and released. Flesh samples and livers from two big-eyed tuna, 3 albacore tuna, and 2 white marlin were frozen for investigations at Scripps Institution of Oceanography on concentrations of fallout radio-nuclides in the marine environment. BT mes-

sages were transmitted to the Naval Oceanographic Office when the vessel was within contact range of Coast Guard radio stations. Note: See Commercial Fisheries Review, July 1965 p. 32.

\* \* \* \* \*

#### TRAWL GEAR EVALUATION STUDIES CONTINUED:

M/V "Delaware" Cruise 65-8 (August 11-20, 1965): Comparative studies of fishing trawls initiated during a June 1965 cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware were continued on this cruise. The two nets used in the studies were a No. 41 trawl and an Atlantic Western trawl.

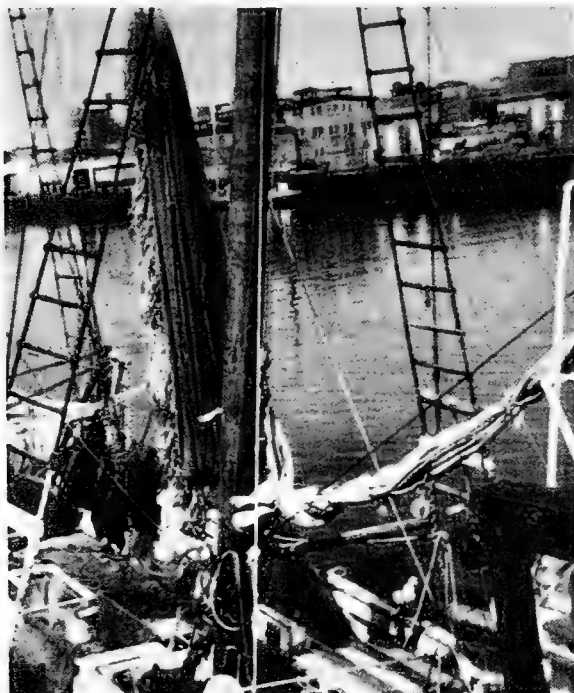


Fig. 1 - Portion of deck of exploratory fishing Delaware.

The No. 41 trawl used was of No. 54 braided nylon. Roller gear was comprised of a 15-foot center section of 18-inch rubber rollers. Each wing had 15 feet of 16-inch wooden rollers and rounded sweep ropes. The trawl was rigged with 5-fathom legs and a 10-fathom ground cable. A set of rectangular wooden trawl doors, measuring 10 feet 6 inches by 4 feet 6 inches and weighing 1,480 pounds each (dry), were used with this net.

The Atlantic Western trawl was constructed from No. 150 polyethylene twine and rigged with 20-inch rollers as on Cruise 65-5. The 10-fathom ground cables used during the first experiment were eliminated early in this cruise to help prevent tear-ups. The trawl doors used were oval type weighing 2,200 pounds each and measuring 10 feet 4 inches by 5 feet 10 inches.

A towing schedule was set up to equate the number of tows with each net during periods of daylight and darkness. All tows were for 1 hour with the exception of a few 1½ hour tows made concurrently with commercial fishing vessels in the immediate vicinity.

Five areas on Georges Bank were fished; they were two areas along the Northern Edge, the easterly end of the Northern Edge, the easterly side of the Leg, and the Northeast Peak.

Fishing on this cruise was extremely poor in all areas. Average catches for both nets for the trip were only a little over 200 pounds per 1-hour tow, and the best catch was 1,800 pounds.

Only one tear-up, resulting in damage to the wings of the Atlantic Western trawl, was encountered in over 50 tows. The sections for that net were cut and finished after the tear-up and repairs were made. Pre-cut sections would have allowed the repairs to be made with no difficulty in a short time.



Fig. 2 - Fish in trawl net of the M/V Delaware.

Difficulty was experienced with the oval doors during the trip. The forward door had a tendency to lay over on its back and some scuffing of the wood resulted. It was found

that if the wires were held tightly enough when setting out, the problem could be minimized.

As neither net seemed to be fishing properly, the catch results of this cruise cannot be considered a valid assessment of the relative catching ability of the two trawls. In view of the problems encountered, further work will be necessary to obtain an accurate evaluation of the trawls. Additional cruise time was to be scheduled to effect proper gear performance and to continue comparative fishing trials.

Note: See Commercial Fisheries Review, September 1965 p. 36.



## North Atlantic Fisheries Investigations

### LOBSTER AND SEA HERRING POPULATIONS AND LARVAE STUDIED:

M/V "Delaware" Cruise 65-9--Herring Investigations (August 26-30); Lobster Investigations (August 31-September 4, 1965): Herring and lobster investigations were conducted during this cruise in the North Atlantic Ocean (northern part of Georges Bank, Little Georges, and Corsair and Veatch's Canyons) by the U. S. Bureau of Commercial Fisheries research vessel Delaware. The objectives were to: (1) sample populations of sea herring and lobsters and obtain related environmental data, (2) obtain sea herring and lobster blood samples, and (3) make plankton tows for herring and lobster larvae.

**FISHING OPERATIONS:** Herring: Four herring trawl sets were made at the stations worked. The sets (1 hour each) made in waters of 30 to 45 fathoms yielded a total of 34 bushels (2,400 pounds). The herring caught were from 25.9 to 34.9 centimeters (about 10 to 13.7 inches) long. The 1960 year-class was dominant in the catches, followed in percentage occurrence by the 1961 and 1962 year-classes. Examination of gonadal development was made and a total of 30 blood samples was obtained and stored for analysis. Species of fish caught, other than herring were whiting (4 bushels), butterfish ( $\frac{1}{2}$  bushel), yellowtail ( $\frac{1}{2}$  bushel), and haddock (185 bushels). At one station, 160 bushels of haddock (over 11,000 pounds) were caught.

**Lobster:** A total of 17 trawl sets was made at the 3 lobster stations covered. The sets made in waters ranging in depth from 15 to 220 fathoms yielded 43 lobsters (28

females, 9 of which were berried, and 15 males). Most of the lobsters were caught at Little Georges at depths of 25 fathoms or less. Two lobsters were soft-shelled and the average weight of all lobsters caught was about  $4\frac{1}{2}$  pounds. They ranged in weight from  $\frac{1}{3}$  to 12 pounds. Eleven blood samples were obtained for analysis.

**PLANKTON OPERATIONS:** Herring: Seven 1-meter net plankton tows lasting 15 minutes each (5 minutes at 10 meters, 5 minutes at 5 meters, and 5 minutes at the surface) were made during the cruise. No herring larvae were obtained in those tows.

**Lobster:** Four 1-meter net plankton tows of 15 minutes each (at the surface) were made during the cruise, all without lobster larvae.

**HYDROGRAPHIC OBSERVATIONS:** Five sea-bed drifters and 5 drift bottles were released at hydrographic stations, and at each station bathythermograph (BT) casts were made, surface salinities collected, and weather observations recorded.

Note: See Commercial Fisheries Review, July 1965 p. 35.

\* \* \* \* \*

### DISTRIBUTION OF ZOOPLANKTON AND LARVAL LOBSTERS IN GULF OF MAINE STUDIED:

M/V "Rorqual" Cruise 5-65 (August 14-28, 1965): To determine gross distribution of zooplankton and larval lobsters and to take environmental measurements at selected continuity stations in the coastal areas of the Gulf of Maine were the objectives of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Rorqual.

Oblique tows from 0-20 meters (65.6 feet) with the Gulf of Mexico No. III trawl and surface tows with the Boothbay No. 1 trawl equipped with a special lobster net were made at each station worked.

Preliminary findings during the cruise indicated that volumes of zooplankton decreased from west to east along the Gulf of Maine coast. In the Gulf's western area, copepods dominated the zooplankton. Crustacean eggs and fish eggs dominated the catches made in the central and eastern areas. A total of 47 lobster larvae was collected, 41 of which were in the fourth developmental stage and 6 in the first stage. The heaviest concentration was found in the offing of Penobscot Bay

where 24 fourth stage larvae were captured. Heavy concentrations of "brit" size herring were observed in the Frenchman's Bay area; no other concentrations of herring were located.

A 5-bottle (Nansen) cast, a bathythermograph (BT) cast, and a Secchi disc reading was made at each station. Five drift bottles and 5 sea-bed drifters were released at each station.



## North Atlantic

### FOREIGN FISHING ACTIVITY OFF COAST, SEPTEMBER 1965:

There was a slight increase in Soviet fishing activity in the North Atlantic from August to September 1965. A total of 112 vessels were sighted during September. They were identified as 51 fish factory stern trawlers, 43 side trawlers, 16 processing and refrigerated fish transports, 1 fuel and water tanker, and 1 tug. This compared with an estimated 75 vessels sighted during August 1965, and 176 vessels in September 1964.



Fig. 1 - Soviet factory stern trawler (Tropik class) alongside fish transport vessel in Northwest Atlantic.

The observations were made by the staff of the Fisheries Resource Management Office, U. S. Bureau of Commercial Fisheries, Gloucester, Mass., which conducts weekly reconnaissance flights cooperatively with the U. S. Coast Guard.

Soviet fishing operations during the month generally ranged from the Cultivator and Georges Shoals area to the "Southeast Part" of Georges Bank, 70 to 150 miles east of Cape Cod. All vessels were actively engaged in fishing operations. Moderate to heavy catches of fish observed on decks and in their trawls appeared to be primarily whiting with a small mixture of herring. In



Fig. 2 - Soviet fish transport operating in Northwest Atlantic.

many instances crews on board the large side trawlers were cutting and dressing out fish. From their size, shape, and color, those fish were believed to include substantial amounts of small haddock and mixed groundfish. The fish were bagged in sections of netting and transferred to nearby processing vessels. Similar catches were also observed on board the Soviet factory stern trawlers.

It appeared that the Soviet fishing vessels have not placed any great emphasis on fishing for herring in 1965. Up until this year, herring has been the vessels' mainstay in total catch since they first arrived in the North Atlantic area in 1961.

During September there was a substantial decrease in Soviet vessels in waters adjacent to Nova Scotia, principally of the SRT and SRT-R class. That can be attributed to those vessels fishing constantly since early spring 1965 and their probable need for major repairs. Another reason may be because of the severe weather conditions that prevail in late fall.

In addition to Soviet fishing activity, 5 Polish stern trawlers and 1 side trawler, and 2 Rumanian stern trawlers were observed fishing on the Cultivator Shoals area during September. Those vessels were actively fishing and believed to be taking large quantities of small haddock.

Note: See Commercial Fisheries Review, October 1965 p. 41.



## Oregon

### YOUNG CHINOOK SALMON RELEASED IN EXPECTATION OF WILLAMETTE RIVER POLLUTION IMPROVEMENT:

In early September 1965, the U. S. Fish and Wildlife Service announced plans for the immediate release of one million spring chinook salmon fingerlings in the upper Clackamas

River drainage system in the expectation that pollution in the Willamette River would subside to a safe level by October 1965 when the fish began moving downstream through Portland's critical contamination zone.

The one million young fish originally had been scheduled for release in late August 1965 from Eagle Creek National Fish Hatchery near Estacada, Oregon. But the August release was postponed because of the serious pollution problem which existed at that time in the lower Willamette River. It was feared that the young salmon would die in the oxygen-deficient water as they attempted to swim through Portland's harbor en route to the ocean. By September, however, there had been some improvement in the pollution situation and fishery scientists expected cooler weather and autumn rains to relieve the oxygen problem, thus assuring safe passage for the salmon.



## Pesticides

### DANGER OF CHEMICAL PESTICIDES TO MARINE LIFE UNDER STUDY:

Amazingly small amounts of pesticides can kill shrimp, crab, and other aquatic life. One part of DDT in one billion parts of water (1 p.p.b.) was found to kill blue crab in 8 days. (One part per billion is the relationship 1 ounce of chocolate syrup would bear to 10 million gallons of milk.)

Those and other new findings on the dangers of certain chemicals to wildlife are given in the 1964 annual report on pesticide research by the U. S. Fish and Wildlife Service. The purposes of the continuing study are to (1) determine the kinds and amounts of pesticides that are injurious to fish and wildlife and (2) assist in discovering ways to achieve pest control with the least hazard to fish and wildlife resources.

The researchers found that commercial brown and pink shrimp exposed to less than half of one part of heptachlor, endrin, or lindane in one billion parts of water were killed or immobilized in 48-hour laboratory tests. Those chemicals, like DDT, are chlorinated hydrocarbon insecticides. In the laboratory, paralyzed fish or shellfish may live for days, even weeks. But in the sea, where only the fittest survive, death may result almost immediately.

Under experimental conditions, the oyster detects and stores pesticides present in the water at concentrations as low as 10 parts per trillion. Pesticides stunt the growth of oyster shells. To test oyster growth, researchers filed off the thin new growth on the edge of the shells, put some oysters in water containing a pesticide, others in clean water. The results became obvious in a few days: the shells of those in clean water grew back; the others showed no perceptible growth.

The researchers found that most of the chlorinated hydrocarbons, at a concentration of 1 part per million for 4 hours, decreased plankton productivity 50 to 90 percent. Another group of pesticides, the organic phosphorous compounds, proved much less toxic.

All life forms in the sea depend on plankton which consists of microscopic plants and animals grouped by billions. Scientists fear that great kills of plankton could be caused by pesticides and not be noticed. Their absence, however, could mean the loss of an entire crop of fish dependent on them for food.

An important part of the research program seeks to learn the significance of pesticide residues. Fish and wildlife have been caught alive, and apparently healthy, which contained levels well above those considered lethal in laboratory tests. Those specimens had not taken in at any one time doses large enough to kill them. Over a long period of time, however, they had accumulated and stored the pesticides in their fat. For these specimens, a period of stress during which they would have to use their reserve of fat might prove fatal.

The research program of the U. S. Fish and Wildlife Service also seeks to compare the relative toxicity of many pesticides to fish and wildlife so that the least toxic ones can be used against pests.



## Safety at Sea

### EXPLOSIVE HAZARDS AT SEA:

The U. S. Coast Guard warns fishermen that both explosive and nonexplosive mines, torpedoes, and other ordnance may be present in coastal waters subject to bottom fishing operations.

New England vessels fishing off the Virginia Capes have reported picking up non-explosive and explosive objects at the following locations: 1H4-1890, 1H4-2300, 1H4-2152, 1H4-2218, 1H5-2935, 1H5-2960, 1H5-2980, 1H5-2978.

The Coast Guard advises that nonexplosive ordnance such as practice torpedoes will normally be painted bright yellow or orange. Any such item which cannot be readily identified by sight as nonexplosive must be treated as an explosive item. If in doubt about the identity of an object, treat it as an explosive. Do not attempt to bring the object on board or alongside. If possible release the object immediately and radio the nearest Coast Guard or Navy station giving an accurate position of your vessel.

If the object cannot be released or freed by cutting fishing lines or nets, the following actions are advised: (1) Stream object as far aft as possible. (2) Notify shore station and stand by for instructions and assistance. (3) Keep crew at forward end of vessel with deck house between them and object astern. (4) Maintain steerageway as necessary to stay in area until assistance arrives.



## South Atlantic Fisheries Explorations and Gear Development

### CALICO SCALLOP AND SHRIMP EXPLORATIONS OFF FLORIDA EAST COAST:

M/V "Oregon" Cruise 103 (August 16-27, 1965): A 12-day shrimp and scallop exploratory cruise off Florida's east coast was completed August 27, 1965, by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon (see map page 35).

Seasonal assessment was made of the Cape Kennedy calico scallop (Pecten gibbus) bed and shrimp trawling was conducted at night to extend exploratory fishing coverage in the 30- to 40-fathom depth range off the Florida east coast. Brown and pink shrimp (Penaeus aztecus and P. duorarum) were located in that area by the Oregon during January 1965 cruise.

**CALICO SCALLOPS:** A total of 54 drags lasting 30- to 45 minutes each was made

with a 6-foot tumbler dredge in depths ranging from 14 to 37 fathoms. Calico scallop catches varied from 0 to 595 pounds per drag. Catches of commercial size scallops measuring 50-60 millimeters (2.0-2.4 inches) of over 100 pounds per drag were made in the 27- to 33-fathom depth range. The most productive depths were 28 to 31 fathoms. The scallops were in prime condition and yielded 57 to 72 (average 63) meats to the pound.

About 300 pounds of small calico scallops measuring 25-35 millimeters (1.0-1.4 inches) were taken with a 40-foot flat trawl in 22 fathoms. That gear also caught commercial-size scallops (2.0-2.2 inches) up to 115 pounds per hour drag in 36 fathoms yielding 110 meats to the pound.

**SHRIMP:** A total of 55 drags lasting from 30 to 90 minutes each was made with 40-foot flat trawls fished on 6- and 7-foot chaindoors in depths ranging from 6 to 54 fathoms. Irregular bottom was encountered from 39 to 52 fathoms. Small amounts of pink shrimp were found in 9 to 11 fathoms where catches ranged from 0 to 20 pounds of 21-25 and 26-30 (heads-on) count shrimp per drag. Incidental fish catches consisted mostly of spot (Leiostomus xanthurus), croaker (Micropogon undulatus), pinfish (Lagodon rhomboides), and filefish (Stephanolepis hispidus).

Trolling lines, maintained while steaming during daylight hours, caught 3 amberjack (Seriola dumerili), 4 little tuna (Euthynnus alletteratus), 2 dolphin (Coryphaena hippurus), 1 king mackerel (Scomberomorus cavalla), and 1 barracuda (Sphyraena barracuda).

Note: See Commercial Fisheries Review, June 1965 p. 33.



## Tennessee Valley Authority

### TRAWLER PURCHASED FOR COMMERCIAL "ROUGH FISH" EXPLORATIONS:

A 35-foot fishing trawler has been purchased by the Tennessee Valley Authority (TVA) for research on commercial fishing--principally for explorations in the TVA water complex and impoundments to produce "rough fish" in commercial quantities.

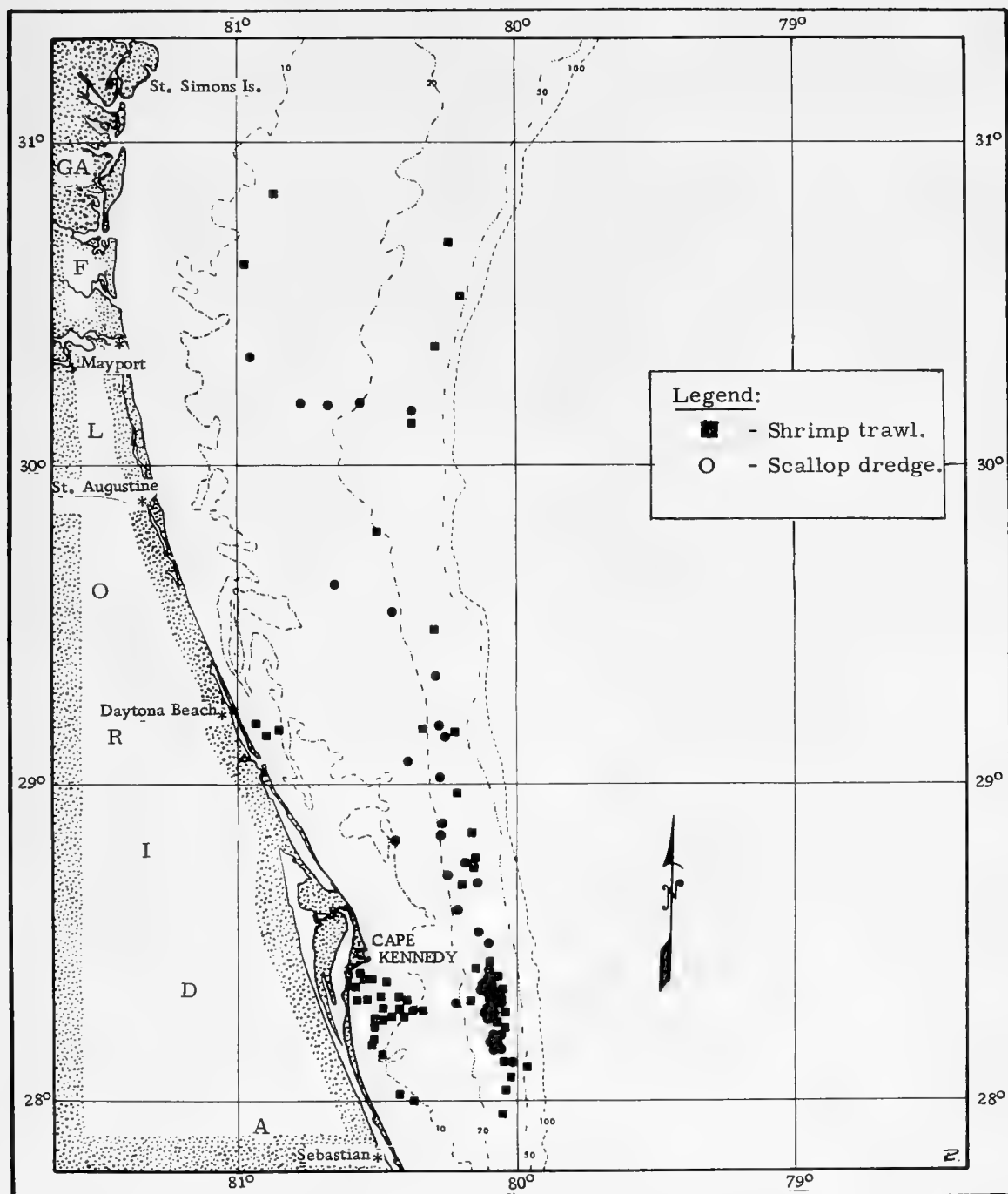
The vessel will be used in testing methods that could assure a large and sustained supply of "rough fish" for industrial fish markets. An assessment made several years



ago of TVA reservoirs has shown a total "rough fish" population of about 61,000 tons, much of which is not being harvested. The annual "rough fish" production has been a-

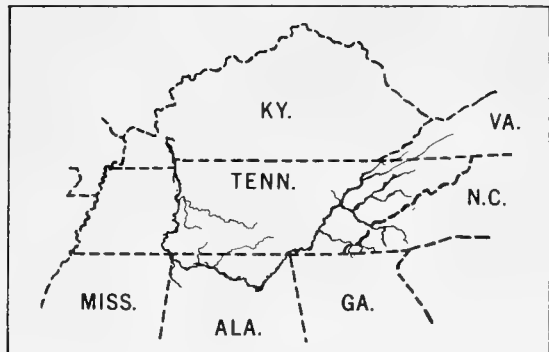
bout 3,000 tons, with the belief that it could be safely increased to 30,000 tons a year.

It is estimated there is a \$9 million annual potential for commercial fishing in TVA



Area investigated off Florida's east coast during M/V Oregon cruise 103 (August 16-27, 1965).

waters if industrial fish markets can be established. Such markets include livestock and pet feed manufacturers and fertilizer producers as outlets for industrial fish if large enough quantities are available and dependable sources of supply are developed.



TVA biologists also believe that several of the lakes would produce more game fish for sport fishermen if heavier commercial fishing could reduce the competition from "rough fish" and other underutilized species.

The 1963 TVA commercial fish catch was 5.6 million pounds valued at \$2 million. The catch by sport fishermen that year was more than 16 million pounds and involved expenditures by anglers of some \$41 million. (TVA Weekly News Letter, September 16, 1965.)

Note: See Commercial Fisheries Review, March 1964 p. 28.



## Trout

U. S. TROUT FARMERS ASSOCIATION CONVENTION, OCTOBER 6-8, 1965, IN WASHINGTON, D. C.:

The Thirteenth Annual Convention of the U. S. Trout Farmers Association was held October 6, 7, and 8, 1965, in Washington, D. C. The Convention heard speakers on trout nutrition, trout production in various countries, problems in marketing dressed and live trout, fish diseases, and other pertinent subjects. (U. S. Trout News, July-August 1965.)



## Tuna

PACIFIC ALBACORE TUNA FISHERY AFFECTED BY ERRATIC WATER TEMPERATURE CHANGES, JULY-AUGUST 1965:

July: Sea surface temperatures recorded at the Scripps Institution of Oceanography, La Jolla, Calif., in July 1965 established a new record low for the month. The July 1965 temperatures averaged 63.0° F., or 5.1° colder than the long-term mean, and 1.4° colder than the previous July low of 64.4° F., recorded in 1944. The cold is believed to have delayed the albacore and bluefin tuna fisheries of the Pacific Coast.

California albacore landings in July 1965 totaled only 1.7 million pounds, the lowest since 1946. The southern segment of the albacore fishery apparently was delayed 3 to 4 weeks by unseasonal ocean cooling in the Point Conception offshore region in April and early May, whereas the albacore season in the Pacific Northwest began about 1 to 2 weeks later than usual. Albacore were not found by northwest fishermen until July 21, 1965, when they appeared in waters about 200 miles southwest of the Columbia River mouth.

The inshore upwelling along the Pacific Coast commenced later than usual in 1965, and through July was somewhat restricted in area. Nearshore temperatures in a narrow band along the Baja California coast were colder in July, and prevailing northwesterly winds were stronger and more persistent in the region extending from Cedros Island south to Cape San Lucas. As a result, the bluefin tuna purse-seine fishery got off to a late start in the third week of June, and California bluefin tuna landings as of July 31, 1965, of 1.5 million pounds were the lowest in 12 years. Intensified local upwelling and the occurrence of very cold, "green" water probably contributed to the poor showing of bluefin in areas where they usually appear early in the season. Guadalupe Island was situated in a band of cold water, about 63°-64° F., and catches were very light in that area.

Cold inshore temperatures also appear to have induced a southward movement of typically northern fish species. Mexican fishermen took silver salmon in gill nets set for white sea bass off Pescadero Point (about 20 miles southwest of Tijuana, Baja California) in 16-18 fathoms of water on August 2, 1965.

The nets were set 2 to 3 fathoms off the bottom. Substantial catches of pink salmon were reported at Eureka, Calif., during the last week of July.

Later in the summer of 1965, Pacific coastal sea surface temperatures appeared to be warming at an above average rate.

The profound effects that rapid, short-term ocean temperature changes have on the success of fisheries for given species are just now beginning to form part of a distinguishable pattern.

August: The unusual weather and oceanographic conditions in the eastern North Pacific Ocean during July 1965 continued into August, and were followed by a reversal of coastal sea temperature deviations near mid-month. Cyclonic weather patterns prevailed in the eastern North Pacific during August, bringing about a substantial alteration in the high pressure buildup along the coast (which is normal for that time of year). The usual strong northwesterly wind flow was virtually absent until the fourth week of the month, allowing the albacore tuna commercial fishing fleet to penetrate farther offshore in northern waters.

The prevailing southwesterly flow offshore appeared to cause the eastward extension of the warm sea temperature deviation pattern first noted in July, and by month's end, warmer-than-average conditions prevailed from Vancouver Island south about 600 miles to Cape Mendocino and east of 130° W. longitude. The 60° F. isotherm generally paralleled the coastline, and appeared to remain well within 60 miles of the beach from Point Conception, Calif., all the way north to Cape Flattery, Wash.

Albacore tuna landings in southern California during July 1965 were the lowest on record, according to data tabulated since 1945. August landings failed to make up for the earlier deficit. As a result, landings to August 31, 1965, were among the lowest reported since before World War II. North coast albacore tuna fishing was variously reported as good to outstanding. Near the end of August, reports were that cold-storage facilities in the Pacific Northwest were being "swamped." Continued good weather and heavy production appeared in prospect for the Oregon coast region pointing to good

September catches of albacore tuna in that area.

Note: Ocean studies are being given renewed emphasis by the Tuna Forecasting staff of the U. S. Bureau of Commercial Fisheries. They ask that all unusual and noteworthy occurrences of fish species found outside a usual range, as well as corresponding observations of unusual sea conditions associated with them, be reported to the Tuna Resources Laboratory, U.S. Bureau of Commercial Fisheries, P.O. Box 271, La Jolla, Calif. 92038.



## U. S. Fishing Vessels

### FISHERIES LOAN FUND AND OTHER FINANCIAL AID FOR VESSELS, JULY 1-SEPTEMBER 30, 1965:

From the beginning of the program in 1956 through September 30, 1965, a total of 1,672 applications for \$43,143,095 was received by the U. S. Bureau of Commercial Fisheries, the agency administering the Federal Fisheries Loan Fund. By that date, 874 applications (\$19,281,779) had been approved, 555 (\$13,049,319) had been declined or found ineligible, 213 (\$8,089,892) had been withdrawn by the applicants before being processed, and 30 (\$693,968) were pending. Of the applications approved, 325 were approved for amounts less than applied for--the total reduction was \$2,028,137.

The following loans were approved from July 1 through September 30, 1965:

New England Area: Kenneth M. Ames, Tenants Harbor, Me., \$1,500; Clarke C. Chappelle, Jr., Wakefield, R. I., \$7,000.

South Atlantic and Gulf Area: Julian Brown, Jr., Marshallberg, N. C., \$8,500; Dan H. Allen and Carolyn S. Allen, Freeport, Tex., \$15,200.

Pacific Northwest Area: E. H. Jenness and Ethel B. Jenness, Bellingham, \$4,500; Edson W. Stephan, Roseburg, \$5,000; Glen Washburn, Port Angeles, \$8,000; all in Washington.

Alaska: Philip Clausen, Petersburg, \$19,408; Richard I. Eliason, and Betty M. Eliason, Sitka, \$6,000.

Under the Fishing Vessel Mortgage Insurance Program (also administered by the Bureau) during the third quarter of 1965, a total of 9 applications for \$459,403 was received. Since the program began (July 5, 1960), 86 applications were received for \$7,928,395.

Of the total, 71 applications were approved for \$5,200,135 and 7 applications for \$1,081,715 were pending as of September 30, 1965. Since the mortgage insurance program began, applications received and approved by area are:

New England Area: Received 13 (\$1,464,500), approved 9 (\$1,034,928).

California: Received 2 (\$1,262,000), approved 2 (\$1,262,000).

South Atlantic and Gulf Area: Received 58 (\$3,266,049), approved 51 (\$2,312,137).

Pacific Northwest Area: Received 8 (\$1,861,250), approved 5 (\$526,296).

Alaska: Received 5 (\$75,596), approved 4 (64,774).

The first applications for a Fishing Vessel Construction Differential Subsidy under the Bureau's expanded program were received in December 1964. Through September 30, 1965, a total of 47 applications for \$10,398,500 had been received. Public hearings on 24 applications were completed during that period and invitations to bid for 6 vessels were sent out.

Note: See Commercial Fisheries Review, August 1965 p. 57; November 1964, p. 61.



## U.S. Foreign Trade

### IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

United States imports of tuna canned in brine during January 1-September 4, 1965, amounted to 31,396,725 pounds (about 1,495,082 standard cases), according to preliminary data compiled by the U.S. Bureau of Customs. That was an increase of 19.4 percent from the 26,920,792 pounds (about 1,251,942 standard cases) imported during January 1-August 29, 1964.

The quantity of tuna canned in brine which can be imported into the United States during the calendar year 1965 at the  $12\frac{1}{2}$  percent rate of duty is limited to 66,059,400 pounds (or about 3,145,685 standard cases of 48 7-oz. cans). Any imports in excess of that quota will be dutiable at 25 percent ad valorem.



## Wholesale Prices

### EDIBLE FISH AND SHELLFISH, SEPTEMBER 1965:

The rising price trend for fishery products continued in September 1965. For July-September 1965, prices with few exceptions were mostly higher for a number of the major fresh and frozen fish and shellfish products, and for canned pink salmon. At 116.2 percent of the 1957-59 average, the wholesale index for edible fishery products (fresh, frozen, and canned) rose 1.7 percent from August to September 1965. Compared with September 1964, that index this September was up 5.9 percent because of substantially higher prices for large haddock, Great Lakes fresh-water fish, frozen fillets, and several canned fish products.

The subgroup index for drawn, dressed, or whole finfish was up 1.8 percent from Au-



gust to September. At New York City from August to September prices rose sharply for Great Lakes round yellow pike (up 35.7 percent) because of the Jewish Holi-

day demand and rose slightly for western fresh salmon (up 2.7 percent). Those higher prices were partly offset by lower prices at Boston for ex-vessel large haddock (down 3.8 percent) and at Chicago for Lake Superior fresh whitefish (down 9.5 percent). As compared with September 1964, the subgroup index this September was up 5.2 percent because prices this September were up 72.6 percent for yellow pike, 28.1 percent for haddock, and 21.0 percent for whitefish. The exceptions were halibut and salmon which were down from the high September 1964 prices.

Although September 1965 prices for fresh haddock fillets at Boston rose 17.1 percent from the previous month, they were in large part cancelled out by a 7.0-percent drop in prices at New York City for South Atlantic fresh shrimp. This brought the fresh processed fish and shellfish subgroup index down by 1.4 percent. Prices for standard shucked

Wholesale Average Prices and Indexes for Edible Fish and Shellfish, September 1965 with Comparisons								
Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1957-59=100)			
			Sept. 1965	Aug. 1965	Sept. 1965	Aug. 1965	July 1965	Sept. 1964
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					116.2	114.3	109.8	109.7
<b>Fresh &amp; Frozen Fishery Products:</b>					117.9	117.4	112.8	113.7
<b>Drawn, Dressed, or Whole Finfish:</b>					135.8	133.4	119.0	129.1
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.18	.19	142.1	147.7	91.4	110.9
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.51	.51	150.8	149.4	147.9	162.7
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.94	.91	131.0	127.5	125.8	136.2
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.58	.64	85.8	94.8	87.3	70.9
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.95	.70	155.5	114.6	102.3	90.1
<b>Processed, Fresh (Fish &amp; Shellfish):</b>					107.3	108.8	108.6	107.4
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.48	.41	116.6	99.6	97.2	106.9
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.80	.86	93.7	100.8	100.8	95.5
Oysters, shucked, standards	Norfolk	gal.	7.25	7.13	122.3	120.2	120.2	122.2
<b>Processed, Frozen (Fish &amp; Shellfish):</b>					105.3	104.8	105.7	100.0
Fillets, Flounder, skinless, 1-lb. pkg.	Boston	lb.	.40	.39	100.1	98.8	97.6	92.5
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.38	.38	111.4	111.4	108.5	108.5
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.31	.31	108.7	108.7	112.2	103.4
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.86	.85	101.4	100.8	103.7	95.5
<b>Canned Fishery Products:</b>					113.7	109.4	104.9	103.1
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	27.00	24.50	117.7	106.8	95.9	94.8
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.56	11.56	102.6	102.6	102.6	102.6
Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	7.13	7.13	120.9	120.9	120.9	105.9
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	10.00	10.25	128.3	131.5	131.5	128.3

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

oysters at Norfolk rose 2.0 percent from August to September and were slightly higher than in September 1964. Compared with the same month a year earlier, the subgroup index was down only slightly. Prices for haddock fillets this September were higher by 9.1 percent, but were more than offset by lower prices for fresh shrimp (down 1.9 percent).

Higher prices from August to September for frozen flounder fillets (up 1.3 percent) at Boston and for frozen shrimp (up 0.6 percent) at Chicago were responsible for a 0.5-percent rise in the subgroup index for frozen processed fish and shellfish. Prices for other species of frozen fillets were unchanged from the previous month. As compared with September 1964, prices this September were higher for all items in the subgroup and the index was up 5.3 percent.

The September 1965 subgroup index for canned fishery products rose 3.9 percent from the previous month. Prices for canned pink salmon again moved up, and from August to September were higher by 10.2 percent as a result of the very low 1965 season pack. By the end of the 1965 packing season, the quantity of pink salmon packed was only about 45 percent of the previous season's output. September prices for canned Maine sardines dropped 2.4 percent from the previous month as the new season's pack moved into the market. The new season's sardine pack by the end of September was 60 percent greater than the previous season's pack. As compared with September 1964, the subgroup index this September was up 10.3 percent--prices for canned salmon were up 24.2 percent and for California jack mackerel up 14.2 percent. Prices for other canned fish were the same as in September 1964.





## International

### EUROPEAN ECONOMIC COMMUNITY

#### EUROPECHE PROPOSALS FOR A COMMON FISHERY POLICY:

EUROPECHE is an association of national fishery organizations within the European Common Market (EEC). A summary of proposals for a common fishery policy for the EEC, as reportedly presented by EUROPECHE to the Common Market Commission, was published August 13, 1965, in Dansk Fiskeritidende, a Danish fisheries periodical. Following are the main points of the EUROPECHE proposals as published in Dansk Fiskeritidende:

(1) Fish landings and trade by EEC members should be permitted anywhere within the Common Market.

(2) Market stabilization is the key to increasing income in fisheries.

(3) A consistent market policy must be initiated by regulating landings in the harbors of the North Sea and the Atlantic. Those regulations should at first only include a limited number of species such as cod, coalfish, ocean perch, plaice, mackerel, fresh herring, and salted herring.

(4) For the fish species covered by the regulations, each member country should establish intervention (minimum) prices which must not be set lower than the average of existing intervention prices in member countries or higher than the price determined by production costs. The intervention prices in different EEC countries should eventually be harmonized.

(5) In order to maintain the intervention prices in the transitional period, national funds must be made available for equalization. Later, with equalization within the Common Market, the necessary funds must be obtained on a joint basis.

(6) Fishermen should be pledged to observe the minimum prices established under intervention regulations.

(7) Since the Common Market as a whole is an import area for fisheries products, it should not be closed to nonmembers. But measures must be taken which will insure that imports from third countries will not cause disturbances in the Common Market.

(8) A system of minimum "gate" prices for imports should be introduced which ought not to be less than the highest intervention prices plus 10 percent. The difference between the "gate" price and the import price would be equalized by a levy.

(9) A clause should be introduced which would permit prohibition of imports if a fisheries market within the Common Market became subject to disturbances.

The EUROPECHE proposals are another indication that the EEC may eventually adopt a restrictive Common Market fishery policy. There is of course the precedent of the EEC agricultural policy with its intervention and gate prices. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, August 17, 1965.)

### FISH MEAL

#### PRODUCTION AND EXPORTS FOR SELECTED COUNTRIES, JANUARY-JUNE 1965:

Member countries of the Fish Meal Exporters' Organization (FEO) account for about 90 percent of world exports of fish meal. The FEO countries are Chile, Angola, Iceland, Norway, Peru, and South Africa/South-West Africa.

Peru accounted for about 74 percent of the 1,245,500 metric tons of fish meal exported by FEO countries in January-June 1965.



## International (Contd.):

Table 1 - Exports of Fish Meal by Member Countries of the FEO, Jan.-June 1965				
Country	June		Jan.-June	
	1965	1964	1965	1964
	. . . . (1,000 Metric Tons). . . .			
Chile . . . . .	3.9	10.5	50.3	72.6
Angola . . . . .	1/	5.3	1/21.3	29.2
Iceland . . . . .	6.8	5.3	49.5	53.0
Norway . . . . .	19.2	13.6	92.7	109.0
Peru . . . . .	133.4	106.4	919.3	771.4
So. Africa (including S.-W. Africa) . . . .	22.7	16.7	112.4	106.9
Total . . . . .	186.0	157.8	1,245.5	1,142.1

Table 2 - Production of Fish Meal by Member Countries of the FEO, Jan.-June 1965				
Country	June		Jan.-June	
	1965	1964	1965	1964
	. . . . (1,000 Metric Tons). . . .			
Chile . . . . .	3.5	15.7	44.9	91.0
Angola . . . . .	1/	5.8	1/17.2	30.6
Iceland . . . . .	19.4	17.2	53.7	52.9
Norway . . . . .	36.6	13.8	143.6	99.8
Peru . . . . .	94.1	91.9	880.2	869.6
So. Africa (including S.-W. Africa) . . . .	43.1	29.2	192.3	159.2
Total . . . . .	196.7	173.6	1,331.9	1,303.1

1/Angola data available only for January-May 1965; June data not available.

\* \* \* \* \*

WORLD PRODUCTION, JUNE 1965  
WITH COMPARISONS:

World fish meal production in June 1965 showed only a small increase over the previ-

World Fish Meal Production by Countries, June 1965 with Comparisons				
Country	June		Jan.-June	
	1965	1964	1965	1964
	. . . . . (Metric Tons) . . . . .			
Canada . . . . .	7,025	5,533	36,512	21,934
Denmark . . . . .	12,854	11,776	55,213	41,850
France . . . . .	1,100	1,100	6,600	6,600
German Fed. Repub. . . .	4,795	5,727	31,645	37,277
Netherlands . . . . .	449	600	2,857	3,500
Spain . . . . .	1/	1/	2/13,247	1/
Sweden . . . . .	400	238	4,369	3,666
United Kingdom . . . . .	5,934	6,471	40,573	40,283
United States . . . . .	41,364	44,400	3/79,835	3/87,662
Angola . . . . .	3,513	5,795	20,755	30,542
Iceland . . . . .	19,355	17,210	53,679	52,879
Norway . . . . .	36,627	13,787	143,636	99,835
Peru . . . . .	94,104	91,904	880,219	869,682
So. Afr. (including S.-W. Afr.) . . . . .	42,519	29,316	193,317	159,593
Belgium . . . . .	375	375	2,250	2,250
Chile . . . . .	3,547	15,727	44,914	90,980
Morocco . . . . .	1/	2,700	1,100	6,760
Total . . . . .	273,961	252,659	1,610,721	1,555,293

1/Data not available.

2/Data available only for January-May 1965.

3/Revised.

Note: Japan does not report fish meal production to the International Association of Fish Meal Manufacturers at present.

ous month. A decline in Peruvian output almost offset higher production in the United States, Canada, Denmark, Iceland, Norway, South Africa, and Angola.

World fish meal production in January-June 1965 was up about 3.5 percent from that in the first 6 months of 1964. Peru accounted for about 55 percent of total output in January-June 1965. Most of the principal countries producing fish meal submit data to the International Association of Fish Meal Manufacturers monthly (see table).

## INTERNATIONAL PACIFIC HALIBUT COMMISSION

CLOSURE OF PACIFIC HALIBUT FISHING  
IN AREAS 1, 2, 3A, AND 3B SOUTH:

Fishing in Pacific halibut Areas 2 and 1 ended at 6 p.m. (P.S.T.) on September 15, 1965, the mandatory date of closure. Announcement of the closure to fishing in those areas was made by the International Pacific Halibut Commission since it estimated that the catch limit of 23 million pounds in Area 2 would be reached by that date. There was no catch limit in Area 1 which was scheduled to close at the same time as Area 2.

The Commission previously announced the end of fishing in Area 3A at 6:00 p.m. (P.S.T.)

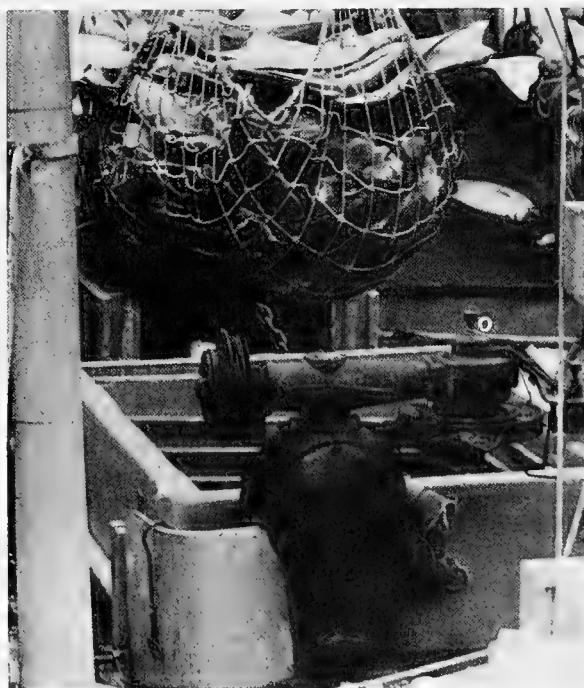


Fig. 1 - Fresh halibut being unloaded with a cargo net from the hold of a halibut fishing vessel at Seattle, Wash.

## International (Contd.):

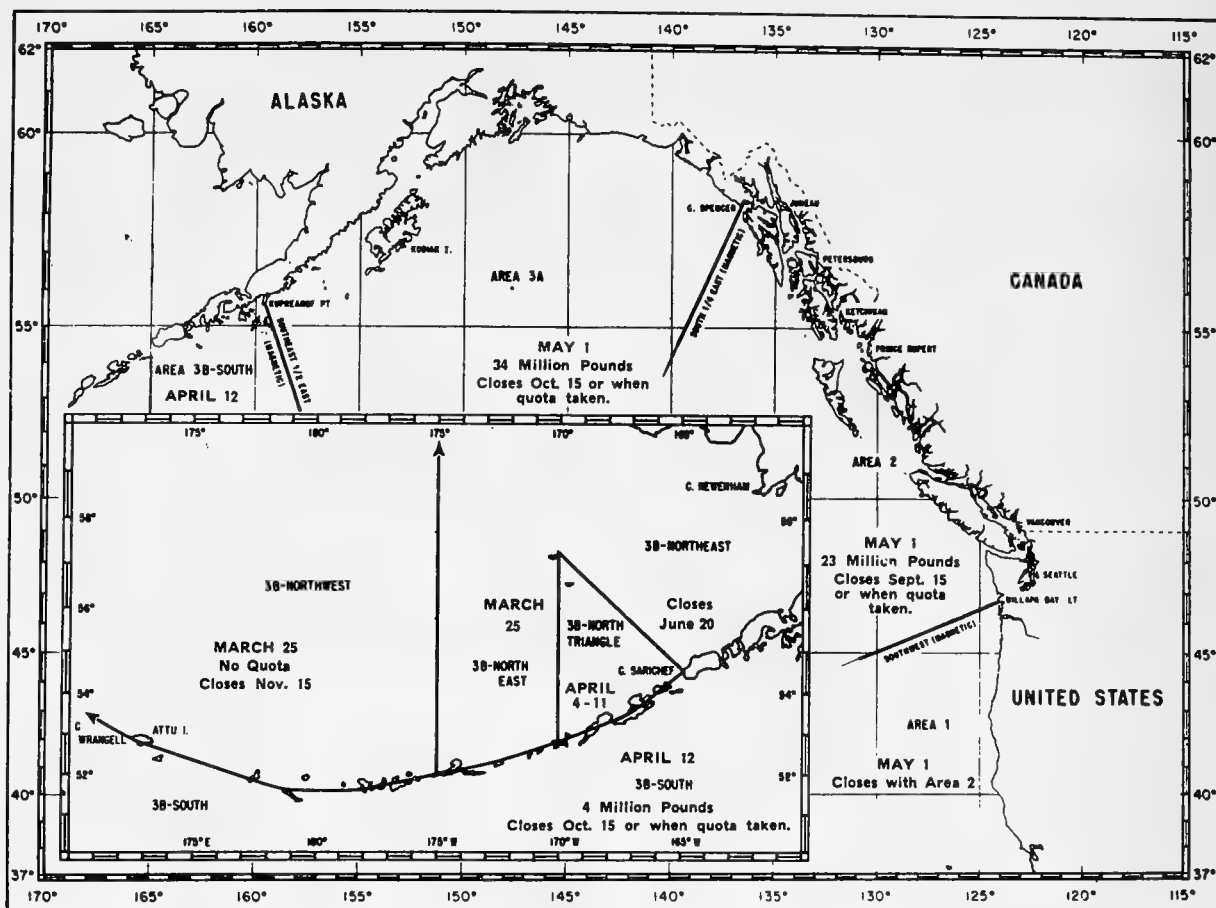


Fig. 2 - International Pacific Halibut Commission chart showing 1965 regulatory areas, opening dates, quotas, and closing dates.

on August 26, 1965, when it was estimated that the area's 34-million-pound quota for the 1965 season would be attained. There will be no halibut fishing in those areas until they are reopened in 1966. In 1964 fishing in Area 3A ended on August 19 when the same catch quota was attained.

Area 2 extends from Willapa Bay to Cape Spencer, Alaska; Area 1 includes the waters south of Willapa Bay, Wash.; Area 3A includes waters off the coast of Alaska between Cape Spencer and the Shumagin Islands.

The catch quota of 23 million pounds in Area 2 is 2 million pounds less than last year's quota of 25 million pounds, and is 5 million pounds less than the 28-million-pound quota in 1963. The catch limit in Area 2 in 1964 was not attained by September 15 when

the season closed. The final catch in that area in 1964 was about 5 million pounds less than the quota.

Halibut fishing season in Area 3B South was scheduled to end at 6 p.m. (P.S.T.) on September 30, 1965, at which time the catch limit of 4 million pounds was estimated would have been attained, announced the International Pacific Halibut Commission on September 9. There will be no halibut fishing in that area until reopened in 1966. Area 3B South includes the waters west of Area 3A, not including the Bering Sea. In 1964, halibut fishing in area 3B South ended on October 15, the mandatory date of closure for that area and the catch limit was the same as this year.

Halibut fishing in the new Area 3B Northwest, which opened on March 25, 1965, with-

## International (Contd.):

out catch limit, remained open to fishing until November 15. In 1965, that area formerly designated as Area 3B North was divided into 2 areas--3B Northwest and 3B Northeast. Area 3B Northeast (also without catch limit) closed on June 20, 1965. Last year fishing in the area designated as 3B North ended on October 15.

Landings by both United States and Canadian fishermen of Pacific halibut from the regulated areas through August 1965 totaled 56.3 million pounds, about 1 million pounds more than the previous year during the same period. Of this year's landings, 26.9 million pounds were by U. S. fishermen and 29.4 million by Canadian fishermen.

## INTERNATIONAL PACIFIC SALMON FISHERIES COMMISSION

**SOCKEYE AND PINK SALMON FISHERY TRENDS IN CONVENTION WATERS, EARLY SEPTEMBER 1965:**

Pink and sockeye salmon fisheries off the northwest coast of North America under the Sockeye Salmon Fisheries Convention (as amended by the Pink Salmon Protocol) are regulated by the International Pacific Salmon Fisheries Commission (IPSFC). The Commission sets fishing time so as to provide for adequate escapement and equal division of the catch between the fishermen of Canada and the United States.

The 1965 season was marked by a pink salmon run which fell far below expectations. The sockeye fishery yielded the forecast modest returns of a light cycle year.

The pink salmon catch in Convention waters as of September 15, 1965, amounted to only 533,260 fish for the United States and 464,341 for Canada. That was far below the pink catch of 4,284,992 fish by United States fishermen and 3,892,823 by the Canadians during the same period of 1963, which was the previous pink cycle year.

The sockeye salmon catch as of September 15, 1965, in Convention waters was about equally divided--United States fishermen had taken 1,024,735 fish and the Canadians 1,024,422. That compares with sockeye catch-

es of 1,376,501 and 1,353,472 fish, respectively, during the same period of 1961, the previous sockeye cycle year.

By early September 1965, it appeared that the sockeye fishery in Convention waters was about over for the season. The pink fishery was also declining as the fish moved toward the spawning grounds. Test fishing indicated a fair escapement of Fraser River pinks into the Georgia Strait area during early September. In August, the Commission had found it necessary to restrict fishing in order to provide for adequate escapement of pink salmon to the Fraser River since that run was considerably below the forecast of 6.5 million fish. (Information Bulletins, International Pacific Salmon Fisheries Commission.)

Note: See Commercial Fisheries Review, Sept. 1965 p. 51.

## INTERNATIONAL LABOR ORGANIZATION

**FISHERMEN'S TRAINING AND WORKING CONDITIONS TO BE REVIEWED:**

A Preparatory Technical Conference on Fishermen's Questions was scheduled to meet in Geneva, Switzerland, October 18-29, 1965, under the sponsorship of the International Labor Organization. The agenda for the conference covered: (1) accommodations on board fishing vessels, (2) vocational training of fishermen, and (3) rules governing fishermen's certificates of competency.

Paul Hall, President of the Seafarers International Union of North America (AFL-CIO), was nominated to attend the conference as a United States labor delegate. The delegation of each attending nation was to include representatives of management and government as well as labor. (The American Fisherman and Cannery Worker, September 1965.)

Note: See Commercial Fisheries Review, March 1963 p. 40.

## MARINE OIL

**WORLD PRODUCTION AND EXPORTS, 1960-1964 AND FORECAST 1965:**

World exports of marine oils in 1965 are expected to decline for the third consecutive year because of the further reduction in baleen whale oil supplies and the decline in sperm oil supplies.

World production of fish oil in 1965 could increase, but there is little indication that any sizable increase in output will occur. Production of herring oil in Norway and Denmark showed an expansion in the early months of

## International (Contd.):

World Marine Oil Production and Exports <sup>1/</sup> , Average 1955-59, Annual 1960-1964, Forecast 1965							
Item	Forecast 1965	2/1964	1963	1962	1961	1960	Average 1955-59
	(1,000 Short Tons)						
<b>Production:</b>							
Baleen whale oil . . . . .	210	249	295	390	428	418	427
Sperm whale oil . . . . .	155	172	149	130	120	122	119
Fish and fish-liver oil . . . . .	740	710	655	750	669	511	428
Total marine oil production . . . . .	1,105	1,131	1,099	1,270	1,217	1,051	974
<b>Exports:</b>							
Baleen whale oil . . . . .	210	249	295	390	428	418	427
Sperm whale oil . . . . .	155	172	149	130	120	122	119
Fish and fish-liver oil . . . . .	440	407	405	386	295	245	160
Total marine oil exports . . . . .	805	828	849	906	843	785	706

1/Exports from producing countries.

2/Preliminary.

Note: Data are estimates based on official statistics of foreign governments, other foreign source materials, reports of U. S. Agricultural Attaches and Foreign Service Officers, and other sources.

1965 as did production of anchovy oil in Peru. But Peruvian anchovy fishing was poor in July and closed in August in 1965. The fish oil situation will depend mainly upon fishing conditions in the fall for Peru and in the summer for the United States. United States production of menhaden oil through June 1965 (33,690 metric tons) was disappointing.

World exportable supplies of fish oil may be somewhat larger in 1965 than in the previous year. Exports from a number of countries, including Peru, Iceland, Chile, and Denmark increased in the early months of 1965 from the same period a year earlier. (Editor's Note: Peruvian exports of fish oil in the first half of 1965 were reported to total 86,200 metric tons as compared to 69,000 tons in January-June 1964. But United States exports of fish oil in the first half of 1965 totaled only 13,685 metric tons as compared with 25,464 tons in the same period of the previous year.) Production of fish oil in the latter half of 1965 will have an important bearing on available supplies because carry-over stocks at the start of the year were at a low level in most exporting countries, other than Peru and Iceland. (U. S. Department of Agriculture, World Agriculture Production and Trade, August 1965.)

## SALMON

# BALTIC SEA CONSERVATION AGREEMENT BETWEEN DENMARK, SWEDEN, AND WEST GERMANY:

A Baltic Sea salmon conservation agreement involving Denmark, Sweden, and West Germany was expected to go into effect in the fall of 1965. Approval of the tripartite

agreement by the West German Forbundsday was reported in September 1965. Denmark and Sweden approved it much earlier. The agreement becomes effective 2 months after deposition of the ratifying documents with the Government of Sweden.

Copies of the agreement are not yet available but it is reported to provide for:

(1) A minimum mesh size in drift gill nets of 165 mm. (6.5 inches) for natural fibers and 157 mm. (6.2 inches) for synthetic fibers, with a 5-year transition period for gear currently in use.

(2) A minimum width of 19 mm. (0.748 inches) between the point and shaft of hooks used in the long-line fishery.

(3) A minimum size of 60 cm. (23.6 inches) for salmon, measured from the tip of the snout to the extreme end of the tail.

Danish, Swedish, West German, and Polish fishermen's representatives also have been discussing institution of a closed salmon season in the Baltic from December 20 to February 10. A closed season in summer also has been suggested but no dates have been agreed upon.

Danish fishermen now are using mostly drift gill nets instead of long lines because of better catches with the fine nylon gear. Mid-water trawls may be used legally by East Germans, but not by Swedish, Danish, or Polish fishermen.

The Danish salmon catch in 1964 totaled 1,455 metric tons with an ex-vessel value of

## International (Contd.):

26.4 million kroner (US\$3.8 million). All but 20 tons of that catch was taken in the Baltic Sea. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, September 15, 1965.)

Note: See Commercial Fisheries Review, Jan. 1963 p. 87.

## WHALING

5-NATION TOKYO CONFERENCE  
ENDS WITHOUT AGREEMENT:

The 5-nation (Japan, Norway, Soviet Union, Great Britain, and the Netherlands) whaling conference, convened at Tokyo, September 1, 1965. It ended on September 7 without agreement being reached on the allocation of the international whale catch quota or the implementation of the observer system. (Suisan Keizai Shimbun, September 8, 1965.)

Note: See Commercial Fisheries Review, October 1965 p. 66.



## Angola

## FISHERY TRENDS IN 1965:

**Floating Laboratory:** A new floating laboratory to be used in fishery research was launched in Lobito, Angola, July 30, 1965. The laboratory-vessel, named the Goa, was built at a cost of 21,000 contos (about US\$735,000) and will be used by the Angolan Fishing Institute in research connected with the fishing industry. Specifications are: length 120 feet; displacement 10.4 feet; average speed 12 knots; and cruising range 5,000 miles.

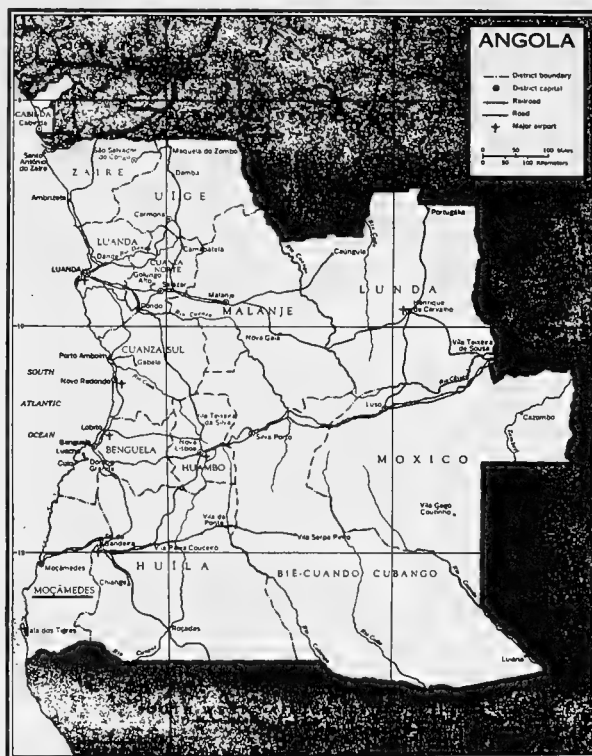
**Fish Meal Plant:** The construction of a new fish meal and oil plant in Benguela has been completed, according to an August 8, 1965, Angolan press report. The plant is said to be almost completely automated and has a processing capacity of 12 tons of fish an hour. The cost of the plant, which was financed by

local capital, was placed at US\$350,000. (United States Consulate, Luanda, August 13, 1965.)

\* \* \* \* \*

FISHERY LANDINGS PRODUCTION  
AND EXPORT TRENDS, 1963-1964:

In 1964, fishery landings at Angola's 4 principal fishery ports (see table 1) totaled 355,810 metric tons with an ex-vessel value of 220,947 contos (US\$7.7 million). That was a gain of 61 percent in quantity and 44 percent in value over the previous year.



Most of Angola's fishery landings go for reduction into meal and oil. Angola's fish meal production increased from 32,798 tons in 1963 to 54,660 tons in 1964, while fish oil

Table 1 - Angola's Fishery Landings at Principal Ports, 1963-1964

Ports	Quantity		Value			
	1964	1963	1964		1963	
	... (Metric Tons) ...		Contos	US\$1,000	Contos	US\$1,000
Luanda . . . . .	33,237	26,439	25,182	877.7	24,739	862.3
Lobito . . . . .	156,247	92,957	116,699	4,067.6	67,082	2,338.2
Mocamedes . . . . .	165,284	119,396	71,898	2,506.0	54,291	1,892.3
Santo Antonio do Zaire . . . . .	1,042	1,055	7,168	249.9	7,220	251.6
Total . . . . .	355,810	239,847	220,947	7,701.2	153,332	5,344.4

## Angola (Contd.):



Pulling fish trap off Equimina, Angola.

output increased from 3,579 tons to 7,435 tons. The production of dried fish and the limited output of canned fish showed little change from 1963 to 1964. Exports absorb almost all of Angola's production of fish meal, fish oil, and canned fish, as well as much of the production of dried fish.

Table 2 - Angola's Production of Principal Processed Fishery Products, 1963-1964

Product	1964			1963		
	Quantity	Value		Quantity	Value	
	Metric Tons	Contos	US\$ 1,000	Metric Tons	Contos	US\$ 1,000
Fish meal	54,660	153,504	5,350.4	32,798	96,382	3,359.4
Fish oil	7,435	21,460	748.0	3,579	8,116	282.9
Dried fish	18,871	61,028	2,127.1	19,143	77,481	2,700.6
Canned fish	1,741	24,901	867.9	1,767	26,941	939.0

Table 3 - Angola's Exports of Principal Fishery Products, 1963-1964

Product	1964			1963		
	Quantity	Value		Quantity	Value	
	Metric Tons	Contos	US\$ 1,000	Metric Tons	Contos	US\$ 1,000
Fish meal	54,434	176,982	6,168.8	27,977	86,753	3,023.8
Fish oil	7,379	24,223	844.3	3,122	7,845	273.4
Dried fish	11,875	69,153	2,410.3	11,354	66,135	2,305.2
Canned fish	1,855	26,240	914.6	1,869	27,330	952.6
Fresh fish	1,887	8,100	282.3	15,823	12,391	431.9

A \$1.4-million project to modernize Angola's fish meal industry was reported in early 1965. Angola newspapers indicated that the Portuguese Development Bank would provide a loan of about \$500,000 to help finance the project. (*Relatório e Contas do Banco de Angola, 1964.*)

Note: See *Commercial Fisheries Review*, June 1965 pp. 40 & 45.



## Australia

## TUNA SURVEY UNDER WAY IN NORTHERN WATERS:

The yellowfin tuna survey off Great Barrier Reef in the Coral Sea, planned jointly by the Australian Federal and State of Queensland Governments, began in early August 1965.

The South Australian tuna fishing vessel *Degei* was chartered for the survey and is working in cooperation with an airplane hired from a Sydney aircraft firm.

Plans were to use the plane to spot tuna shoals, and a supporting fishing vessel to catch and identify the fish. (*Australian Fisheries Newsletter*, September 1965.)

Note: See *Commercial Fisheries Review*, October 1965 p. 66.

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## WESTERN AUSTRALIAN 1965 SHRIMP LANDINGS DOWN FROM PREVIOUS SEASON:

Shrimp landings for the 1965 season in Shark Bay, Western Australia, will be down about 500,000 pounds or 25 percent below the previous season's landings, according to preliminary estimates.

The season this year started late and by the end of May landings of king and tiger shrimp were down 52 percent. Landings improved between May and July but they were still down 21 percent from the same time a year earlier.

Shrimp landings in Exmouth Bay were also reported less than the previous year but did not drop as much as in Shark Bay. (*Australian Fisheries Newsletter*, September 1965.)

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## SHRIMP SURVEY OFF NEW GUINEA SHOWS COMMERCIAL POTENTIAL:

Promising catches of shrimp were reported from Madang, in New Guinea. A 14-foot outboard motor launch, operated by the Australian Federal Government Fisheries Division, caught 56 pounds of banana (*Penaeus merguensis*) and giant tiger (*Penaeus esculentus*) shrimp one mile east of the Ramu River, near Madang.



Australia (Contd.):

The shrimp were caught during a 10-day survey carried out between Madang and We-wak. The catch shows that there are commercial possibilities for shrimp trawling in that area, the chief of the Fisheries Division said.

The survey was to be continued after overhaul of the research vessel. (Australian Fisheries Newsletter, September 1965.)

\* \* \* \* \*

## SHRIMP IMPORTS SOAR TO MEET HOME DEMAND:

Australia imports a large quantity of shrimp, principally from India, Japan, and Hong Kong, in order to meet an acute domestic shortage. Restaurants, clubs, and other institutions in Sydney need large quantities of shrimp for their popular seafood dishes, including a wide range of Chinese meals, and are forced to rely more and more on imports.

India, the main supplier of peeled shrimp, in a 9-month period shipped to Australia 700,000 pounds. It is believed that India will eventually sell Australia 2 million pounds of shrimp a year. This will help fill the gap in supplies for the domestic demand since Australia exports a good part of her shrimp production to Japan, France, and the United States.

There is an Australian tariff of 1 shilling (11 U. S. cents) a pound on imported shrimp which is meant to protect the Australian fishermen. Public opinion is that this has resulted in higher prices and a greater scarcity of shrimp. Australia's largest shrimp distributor said, "The demand is insatiable and everyone wants shrimp." He said the type of shrimp in greater demand by Sydney housewives was peeled small "school" shrimp. Large shrimp were not as scarce and usually went to hotels, restaurants, and clubs.

Australian shrimp importers are forced to compete with United States, Japanese, and French buyers for India-produced shrimp, and pay 11 cents a pound import duty on what they are able to import.

There is a scarcity of good quality small shrimp for the home market because Australian fishermen concentrate on fishing for larger sizes (king, tiger, and banana shrimp), which bring bigger returns from the export trade. Indian and Chinese fishermen, however, who do not have large fishing craft and mechanized equipment to fish in deep water where the large shrimp are found, fish for small shrimp only. (Fish Trades Review, July 1965.)

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### IMPORTS OF MARINE PRODUCTS, 1963/64 AND 1964/65:

In fiscal year 1964/65 (July-June), Australian imports of edible fishery products

Item	1964/65			1963/64		
	Quantity	Value		Quantity	Value	
	1,000 Lbs.	AL 1,000	US\$ 1,000	1,000 Lbs.	AL 1,000	US\$ 1,000
<b>Edible Fish and Shellfish:</b>						
Frozen:						
Fish fillets . . . . .	34,518	4,362	9,684	34,976	4,283	9,508
Other fish . . . . .	3,295	361	801	3,013	300	666
Shellfish . . . . .	2,788	717	1,592	2,188	609	1,352
Canned:						
Herring . . . . .	4,768	530	1,177	4,376	467	1,037
Salmon . . . . .	11,912	3,114	6,913	11,641	2,737	6,076
Sardines and sardine-like fish . . .	6,341	1,001	2,222	6,494	984	2,184
Tuna . . . . .	316	45	100	497	74	164
Other fish . . . . .	1,580	230	511	1,191	132	293
Shellfish . . . . .	1,383	378	839	887	290	644
Smoked, cured, dried, or otherwise prepared . . . . .	9,693	1,296	2,877	10,687	1,221	2,711
Total edible fish and shellfish . .	76,594	12,034	26,716	75,950	11,097	24,635
<b>Industrial Products:</b>						
Fish meal . . . . .	24,657	633	1,405	18,671	434	963
<b>Other Marine Products:</b>						
Cultured pearls . . . . .	1/	539	1,197	1/	323	717
Miscellaneous . . . . .	1/	851	1,889	1/	465	1,032
Note: AL1.00 equals US\$1.00.						

## Australia (Contd.):

totaled 76.6 million pounds with a value of US\$26.7 million--a gain of 1 percent in quantity and 8 percent in value over the previous year. Canned fish and frozen fish fillets continued to be the main items among the edible fishery imports.

In fiscal year 1964/65, imports were somewhat higher for all the main canned items except tuna and sardines. Frozen shellfish imports were also up, but there was a slight decline in imports of frozen fish fillets. (The decline was in the 1-pound pack of fillets--down from 12,090,000 pounds to 11,128,000 pounds; imports of the larger packs of fillets rose from 22,886,000 pounds in fiscal 1963/64 to 23,390,000 pounds in 1964/65.) Higher prices for imported fish fillets helped raise the value of the edible imports in 1964/65 to a record level.

Imports of fish meal were up in 1964/65, and the value of imports of cultured pearls and other marine products was also higher. (Australian Fisheries Newsletter, September 1965.)

Note: See Commercial Fisheries Review, April 1965 p. 55.

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#### EXPORTS AND PRODUCTION OF SPINY LOBSTERS AND TRENDS, FISCAL YEAR 1964/65:

A 17-percent drop in Australian exports of spiny lobster tails in fiscal year 1964/65 and a 56-percent drop in exports of whole spiny lobster point to a further decline in total Australian spiny lobster production--most of it in Western Australia. Spiny lobster fishing is Australia's biggest fishery and nearly all the catch is exported.

In 1964/65 (July 1-June 30), exports of spiny lobster tails dropped by 1,638,000 pounds and exports of whole spiny lobster dropped by 741,000 pounds as compared with 1963/64--the equivalent of about 5 million pounds live-weight basis. These data appeared in the publication Trends in Australian Marine Export Markets by the Fisheries Branch of the Department of Primary Industry.

Final production data for 1964/65 are not complete, but export figures indicate a decline in total Australian production of between 1 million and 2 million pounds live weight when allowance is made for an unusually heavy carryover of export tails and whole lobster

into the first month of the 1965/66 fiscal year.

Australian spiny lobster production in 1963/64 was 27.6 million pounds (live weight), of which Western Australia accounted for 18 million pounds, a drop of 3.4 million pounds from the previous year's record catch.

In 1964/65 exports of spiny lobster tails from Western Australia were down about 2 million pounds and exports of whole lobster were down 475,000 pounds from 1963/64.

Although the quantity of tails and whole lobster exports dropped in 1964/65, the value rose to a record US\$15.8 million due to the strong United States market and a worldwide increase in demand.

Imports of spiny lobster tails account for the bulk of the United States supply, but during the first 6 months of 1965 United States imports were 2 million pounds below those for the same period in 1964. This resulted in the highest prices on record for spiny lobster tails sold in the United States market.

Australia ranks second in the world as a supplier of spiny lobster tails to the United States market. But if Australia is to take full advantage of this valuable market, annual production must be maintained on a continuing basis at the highest possible level. (Australian Fisheries Newsletter, September 1965.)

Note: See Commercial Fisheries Review, January 1965 p. 61.

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#### ABALONE FISHERY TRENDS:

In the first four months of 1965, 90,000 pounds (meats) of abalone was taken from Tasmanian waters. This was worth about US\$24,600 to the fishermen. In 1964, the total abalone catch was 24,119 pounds (meats) valued at \$5,600, which was nearly half the total Australian catch. The number of divers operating varied from 17 to 11.

The Tasmanian Minister for Fisheries has warned that claims that a large abalone industry could be developed were not supported by Government fisheries officers. Although the extent of stocks was not yet known, it was doubtful if the industry could support more than 30 full-time divers. Most of the Tasmanian catch of abalone is being canned by a cannery in Queensland, and some is processed in Victoria and New South Wales.

## Australia (Contd.):

(Australian Fisheries Newsletter, September 1965.)

Note: See Commercial Fisheries Review, April 1965 p. 59.



## Brazil

### SPINY LOBSTER PRODUCTION AND EXPORTS LOWER:

The declining trend of spiny lobster production in northeastern Brazil continued into 1965, with Ceará's lobster fishermen reporting catches less than two-thirds of "normal." As a result, exports of frozen lobster tails from the ports of Recife, Fortaleza, Natal, and São Luiz, dropped from a high of 2,000 metric tons in 1962 to 1,770 tons in 1963, and 1,577 tons in 1964, with a further decline expected for this year. The smaller catch is attributed to overfishing and to exceptional rainfall which has muddied lobster banks located on Brazil's Continental Shelf.

While lobster production and exports have been declining, that region has increased its landings of red snapper from 208 tons in 1962 to 1,050 tons in 1964. Further increases in the red snapper catch are expected as new fishing banks are discovered and export markets develop. (United States Consulate, Recife, September 3, 1965.)

\* \* \* \* \*

### MEXICAN VESSELS BOUGHT FOR FISHERIES VENTURE:

A Brazilian animal feed producer plans to diversify by setting up a fish-processing plant at the port of Belem in northeast Brazil. The new plant is to process fish for export as well as for domestic use. Shrimp, lobster, salted fish, and fish meal are some of the items considered for production.

Three 72-foot steel trawlers for the Brazilian firm are being built in Mazatlan, Mexico. One of the vessels will carry radar and freezing equipment. All will have some refrigeration.

"Bacalao" (salt-cod) is popular in Brazil. A representative of the Brazilian firm wishes to arrange for some of the vessels fishing for cod in the North Atlantic to land their catches in Brazil for processing at Belem.

As an alternative, the firm is interested in finding a substitute for "bacalao" such as, for example, the shark fillets produced in Mexico. (United States Embassy, Mexico, D.F., September 4, 1965.)



## British Guiana

### SHRIMP FISHERY TRENDS:

The shrimp fishery is the dominant and most rapidly expanding fishing activity in British Guiana. Spurred by favorable operating conditions and proximity to rich shrimp grounds, the industry has expanded from a small beginning in 1959 when 9,748 pounds of



Fig. 1 - Shrimp fishing vessels at a processing firm's dock, Georgetown, British Guiana.



Fig. 2 - A shrimp-processing firm's vessel dock in Georgetown. Net lockers and spare parts storeroom at left.

**British Guiana (Contd.):**

shrimp were landed to a record production of 6 million pounds landed in 1964. The number of shrimp vessels operating out of British Guiana from the port of Georgetown has increased from 60 in 1962 to 84 in early 1964 to 107 in 1965. A United States-owned firm in Georgetown that operates about 75 of the shrimp vessels has completed new docking facilities and a new packing and freezing plant with a reported capacity of about 80,000 pounds daily. Most of the production of the local shrimp industry is exported frozen to the United States.



Fig. 3 - Ice-making plant, and unloading and shipping dock of a shrimp-processing firm in Georgetown.



Fig. 4 - Freezing plant and dock of another shrimp-processing firm in Georgetown.

Several trawlers operated by a local firm and numerous small fishing boats are engaged in catching fish for local consumption, but their production is insufficient to supply the local market. Consequently fish imports have been rising in recent years and are now

valued at US\$2.6 million a year. (United States Consulate, Georgetown, August 15, 1965.)

**Burma****FISHERIES TRADE PLACED UNDER GOVERNMENT CONTROL:**

The Government of Burma has declared 18 kinds of common fishery products to be essential commodities. This means that only the Government can buy, sell, store, or transport those items. The order announcing Government control over essential fishery products also provided that the Government may set prices for "nonessential" fishery products. (United States Embassy, Rangoon, September 3, 1965.)

**Canada****DEPARTMENT OF FISHERIES REORGANIZED:**

Expansion and reorganization of Canada's Department of Fisheries so that it can more effectively carry out its responsibilities in the light of expanding fishing activity by Canada and other fishing nations of the world was announced by the Fisheries Minister, August 26, 1965.

The Fisheries Minister said, "It is the objective of the Department through fisheries development programs, integrated with those of the provinces, to exploit resources to a safe maximum, including those species which we have overlooked in the past; to improve techniques of harvesting these resources; and to further increase the quality of our products so there will be an increased demand for them both at home and abroad."

"Changes in the Department's structure," he said, "also result from stepped up scientific and technical programs, and the international aspects of Canada's fisheries involving her participation on seven different international fisheries commissions which are becoming more and more important in the proper conservation and management of the fishery resources of the high seas."

## Canada (Contd.):

"The Civil Service Commission has already made some appointments within the new structure," he added. Under A. W. H. Needler, Deputy Minister, there will be two Assistant Deputy Ministers. S. V. Ozere, Assistant Deputy Minister, is assuming responsibility for the Department's International and Jurisdictional Affairs. W. M. Sprules becomes Director of the International Fisheries Service under Ozere.

R. R. Logie of Halifax, N.S., who headed the Fish Culture Development Branch of the Department in the Maritimes Area has been appointed Assistant Deputy Minister (Operations) effective September 1, 1965. He will have under his direct supervision the activities concerned with conservation, protection, resource development, and inspection, as well as the administration of other special programs such as the Fishermen's Indemnity Plan and the Newfoundland Bait Service.

I. S. McArthur, Chairman of the Fisheries Prices Support Board, has been appointed Director-General of Economic Services and will have general responsibility for directing and coordinating all economic responsibilities and activities in the field of fisheries. W. C. MacKenzie will be Director of the Economic Research and Intelligence Service. A new service of Planning and Policy Analysis also comes into being under McArthur. This service will analyze and evaluate the economic potential of the fishing industry and work out broad development plans on a regional basis in cooperation with the provinces and industry.

As part of the reorganization, the Department's Conservation and Development Service will be divided into two services. They will be the Conservation and Protection Service which will be responsible for the administration and operation of programs designed to protect and maintain fish stocks through regulations, and the Resource Development Service which will be responsible for the application of modern techniques designed to expand stocks of fish.

A. L. Pritchard, Director of the Conservation and Development Service, will maintain his present duties until the reorganization is complete and will then be given special and important duties associated with the conservation of the resource.

"Further changes in organization embracing other activities of the Department will be announced at a later date," the Fisheries Minister said.

\* \* \* \* \*

#### 1965 COHO SALMON GRILSE TAGGING PROGRAM AT GEORGIA STRAIT-DISCOVERY PASSAGE:

A coho salmon grilse tagging program in the northern Georgia Strait and Discovery Passage areas was carried out from mid-September to early November 1965 by the Canadian Department of Fisheries. This was the second tagging program to be conducted in the Georgia Strait region during 1965 for determining the timing and subsequent distribution of a juvenile coho population which demonstrates a mass movement through Johnstone Strait during the fall of each year.

The tagging was carried out on board the drum-seiner Naughty Lady, and began in the Strait south of Campbell River. During the remainder of the program, additional tagging and a tag recovery operation was conducted in Discovery Passage.

Because of the immature stage of the salmon, few tags will be recovered during the 1965 fishing season but those fish will be entering the fishery during the 1966 season. The Canadian Government asks that both commercial and sport fishermen cooperate, as they have done in the past, by returning their tags together with the pertinent recovery information to the Canadian Department of Fisheries, 1155 Robson St., Vancouver 5, B.C., or to the fishery officer in their area. To facilitate the return of tags, sport fishermen are advised that special postage-free tag-return envelopes will be available during the 1966 season at most boat rental and moorage facilities. A nominal reward of 50 cents is offered for the return of each tag and recovery information. (Canadian Department of Fisheries, Vancouver, B.C., September 7, 1965.)

Note: See Commercial Fisheries Review, February 1965 p. 67.

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#### SALMON FISHWAY BEING BUILT AT MEZIADIN FALLS IN BRITISH COLUMBIA:

A \$700,000 fishway on the Meziadin River in northern British Columbia was scheduled for completion by mid-summer 1966 under a contract awarded by the Canadian Department of

## Canada (Contd.):

**Fisheries.** The fishway will enable migrating adult salmon to bypass dangerous Meziadin Falls.

Meziadin River is the largest sockeye salmon-producing stream of the Nass River system and, as such, ranks among the best sockeye rivers on the British Columbia coast north of the Fraser River. The fishway will significantly increase the numbers of healthy spawners reaching upstream sections of the river. This will increase production of young fish and add to the numbers of sockeye salmon available to the commercial fisheries of the area. (Canadian Department of Fisheries, Ottawa, September 2, 1965.)

\* \* \* \* \*

#### **SALMON FISHING LICENSE CHANGES PROPOSED TO REDUCE FISHING PRESSURE:**

Agreement has been reached with representatives of British Columbia fishery organizations on some preliminary steps that might be taken toward controlling the intensity of commercial salmon fishing operations on the Pacific Coast, Canada's Deputy Minister of Fisheries announced September 3, 1965. "Progressive intensification of salmon fishing would ultimately make it impossible for the Department of Fisheries to discharge its responsibility adequately in the conservation of the important salmon stocks," he said.

At a meeting in Vancouver, B.C., between Government and industry representatives there was a discussion of tentative Government proposals to regulate the issuance of salmon fishing licenses. "As a result, it is now planned to modify the proposed procedure for licensing fishermen and to introduce registration of fishing craft. Proposals for a special permit, with a graduated fee structure, for entry into the salmon fisheries were also discussed, but it was agreed that further consideration of this matter was necessary. A second meeting on these and other aspects of the problem will be held later this year or early in 1966," the Deputy Minister of Fisheries said. (Canadian Department of Fisheries, Ottawa, September 3, 1965.)

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#### **NEW ATLANTIC SALMON REARING STATION PLANNED FOR NOVA SCOTIA:**

The immediate construction of a modern Atlantic salmon rearing station at Margaree

on Ingram Brook, Inverness County, Nova Scotia, so that it will be in operation in fall 1965, was announced August 26, 1965, by Canada's Fisheries Minister.

The new station will serve a double purpose for Nova Scotia and New Brunswick salmon runs. It will replace the present fish-culture facilities at Margaree, which have been in continuous operation for years and are worn out. It will also serve as an experimental prototype for the incorporation of advanced techniques in the artificial propagation of salmon which will be used to maintain the salmon population of the Saint John River following completion of the Mactaquac hydroelectric project on that waterway.

The propagation methods to be used at the new station have proved to be highly successful in Sweden, where they were studied in 1964 by senior technical officers of the Canadian Department of Fisheries. Many features of the Swedish method are considered to be readily adaptable to the situation which will develop on the Saint John River at Mactaquac after 1967, when the hydroelectric project is to be completed. Before full-scale facilities are built at Mactaquac, it was decided that a scale prototype, with modifications to make the system more adaptable to the Canadian environment, should be built at Margaree. That decision was made in the interest of economy because the fish-culture facilities at Margaree need replacement rather than repair. (Canadian Department of Fisheries, Ottawa, August 26, 1965.)

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#### **SALMON SALES TO SOUTH AFRICA INCREASING:**

Prosperity in the South Africa Republic is boosting Canadian sales of canned salmon in that area. The South Africa Republic increased its imports of Canadian canned salmon from 71,000 pounds in 1961 to 623,600 pounds in 1964. The value of those imports rose from C\$54,000 in 1961 to C\$398,341 in 1964.

Canada's share of the canned salmon market in South Africa rose from 55 percent in 1963 to 72.8 percent in 1964.

In the South African market, Canadian canned salmon competes with lower-priced salmon canned in Japan and Norway. Those countries dominated the South African salmon market for several years prior to 1962. Canadian salmon shipments to South Africa benefitted



## Canada (Contd.):

from a relaxation of South African import restrictions and a shortage of Japanese salmon.

South African importers of Canadian canned salmon report good prospects for the coming year, provided Canadian prices remain in a competitive range. The South African importers also report increasing sales of Canadian smoked and frozen salmon. (Foreign Trade, Canadian Department of Trade and Commerce, August 1965.)



## Denmark

## EX-VESSEL PRICE TRENDS FOR SELECTED SPECIES, JANUARY-APRIL 1965 WITH COMPARISONS:

Comparing average prices received by Danish and New England fishermen in early 1965 shows that cod and haddock brought better prices in the United States (Boston, Mass.), but prices were higher in Denmark for pollock, hake, wolffish, halibut, whiting, and flatfish.

With the single exception of Danish haddock, average prices for those species in both areas were higher in January-April 1965 than in the same period of 1964.

Export trends strongly influence Danish ex-vessel prices since the bulk of Danish landings are processed into export products. About two-thirds of the Danish catch is accounted for by industrial fish landings and food fish landings of cod, plaice, and herring. Average ex-vessel prices for all of those items were higher in January-April 1965 than in the same period of 1964. The increase was 26 percent for cod (drawn), 35 percent for plaice (drawn), 33 percent for herring (for food), and 9 percent for industrial fish.

The gain in ex-vessel cod prices reflects the increasing world demand for groundfish fillets and blocks. There is also a growing demand in Europe for the quality Danish pack of frozen herring fillets and plaice fillets. Ex-vessel prices for industrial fish increased with the rising world market for fish meal and oil.

A continuation of the trend towards higher ex-vessel prices was indicated by preliminary reports through July 1965. In addition, fishery

Table 1 - Comparison of Average Prices Received by Danish and U. S. (New England) Fishermen for Selected Species, January-April 1964-1965

January-April 1965				January-April 1964			
Denmark		New England <sup>1/</sup>		Denmark		New England <sup>1/</sup>	
Species <sup>2/</sup>	(U. S. Cents Per Pound)		Species <sup>3/</sup>	Species <sup>2/</sup>	(U. S. Cents Per Pound)		Species <sup>3/</sup>
<u>Cod (Torsk):</u>			<u>Cod:</u>	<u>Cod (Torsk):</u>			<u>Cod:</u>
Live	6.58	8.28 (B)	Large	Live	5.39	8.11 (B)	Large
Drawn	7.30	10.71 (B)	Market	Drawn	5.79	9.21 (B)	Market
Dressed	6.70			Dressed	5.79		
Coalfish (Sej)	8.88	7.86 (B)	Pollock	Coalfish (Sej)	8.42	5.99 (B)	Pollock
Haddock (Kuller)	8.02	12.97 (B)	<u>Haddock:</u>	Haddock (Kuller)	8.09	10.70 (B)	<u>Haddock:</u>
		11.65 (B)	Large			9.90 (B)	Large
			Scrod				Scrod
Hake (Kulmule)	23.48	15.23 (B)	White hake	Hake (Kulmule)	19.99	11.53 (B)	White hake
Wolffish (Havkat)	7.96	7.64 (B)	Wolffish	Wolffish (Havkat)	7.23	6.11 (B)	Wolffish
Halibut (Helleflynder)	38.87	33.14 (B)	Halibut	Halibut (Helleflynder)	35.45	28.82 (B)	Halibut
Whiting (Kvilling)	7.43	3.50 (G)	Whiting	Whiting (Kvilling)	6.18	3.02 (G)	Whiting
			Round				Round
Dab (Ising)	13.02	12.08 (NB)	Yellowtail	Dab (Ising)	9.21	9.56 (NB)	Yellowtail
Witch (Skaerising)	13.42	12.08 (G)	Gray sole	Witch (Skaerising)	10.43	11.27 (G)	Gray sole

<sup>1/</sup>Prices are at port of largest landings: B-Boston, G-Gloucester, or NB-New Bedford.

<sup>2/</sup>United States and Danish names. The fish are landed as drawn fish unless otherwise indicated.

<sup>3/</sup>United States names. Groundfish are landed drawn, except hake which is dressed; flatfish are landed round; and whiting prices shown are for round fish.

Note: Comparisons are for the same or similar species.

## Denmark (Contd.):

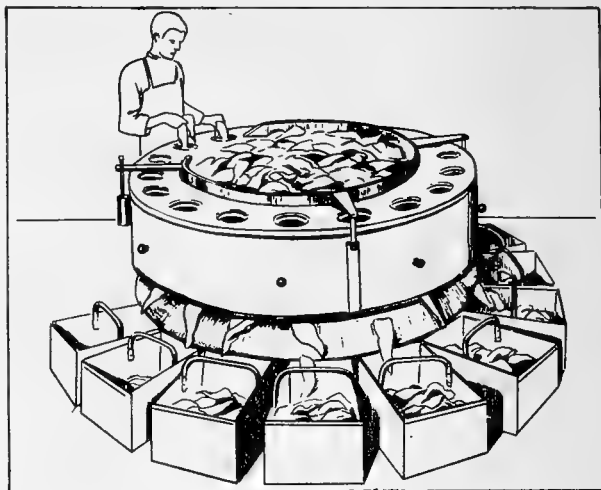
Table 2 - Average Prices for Selected Fish Species Landed in Danish Ports, January-April 1964-1965 and Year 1964

Species <sup>1/</sup>	January-April		Year 1964
	1965	1964	
. . . (U.S. Cents Per Pound) . . .			
Coalfish (Sej) . . . . .	8.88	8.42	8.22
<b>Cod (Torsk):</b>			
Live . . . . .	6.58	5.39	5.79
Drawn . . . . .	7.30	5.79	6.71
Dressed . . . . .	6.70	5.79	6.31
Common mussel . . . . .			
(Blaamusing) . . . . .	.39	.39	.33
Common sole (Tunge) . .	81.82	66.69	66.49
Dab (Ising) . . . . .	13.02	9.21	9.47
<b>Eel (Aal):</b>			
Silver (Blanke) . . . . .	82.67	61.76	69.39
Yellow (Gule) . . . . .	49.39	39.07	41.82
Eel pout (Kvabber) . . .	10.92	10.33	10.13
Flounder (Skrubbe) . . .	6.84	5.52	6.84
Garpike (Hornfisk) . . .	18.88	5.13	3.62
Haddock (Kuller) . . . .	8.02	8.09	7.70
Hake (Kulmule) . . . . .	23.48	19.99	22.10
Halibut (Helleflynder) . .	38.87	35.45	36.04
Herring (Sild) for food <sup>2/</sup>	4.54	3.42	4.01
Industrial (Industrifisk) <sup>2/</sup>	1.51	1.38	1.38
Lemon sole (Rødtunge) . .	25.19	21.24	19.99
Ling (Lange) . . . . .	6.44	5.59	5.79
<b>Lobster (Hummer):</b>			
Norway (Dybvands) . . .	40.38	25.85	30.06
Common (Almindelige) . .	120.23	95.89	121.54
Mackerel (Makrel) . . . .	7.50	5.52	6.05
Octopus (Blaeksprutte) . .	1.84	12.69	16.38
Pike (Gedde) . . . . .	30.06	26.57	27.82
<b>Plaice (Rødspaette):</b> . . .			
Live . . . . .	17.23	12.04	13.09
Drawn . . . . .	17.10	12.64	12.56
Porbeagle (Sildehaj) . . .	23.28	25.06	20.13
Roe (Rogn), mostly cod	15.06	16.25	15.72
Salmon (Laks) . . . . .	98.79	129.50	121.15
<b>Shrimp (Rejer):</b>			
Deep-water . . . . .	26.70	24.99	29.60
Ordinary . . . . .	98.66	108.45	99.58
Sprat (Brisling) . . . . .	11.77	7.37	8.22
Turbot (Pigvar) . . . . .	51.50	28.22	29.86
Whiting (Kvilling) for food	7.43	6.18	6.05
Witch (Skaerising) . . . .	13.42	10.13	11.51
Wolffish (Havkat) . . . . .	7.96	7.23	8.02

<sup>1/</sup>United States and Danish names.<sup>2/</sup>Herring, sand eels, Norway pout, whiting, etc.

Note: Prices listed are mostly for drawn and dressed fish.

tinue. One of Denmark's largest producers (a fishery cooperative) had signed contracts in September 1965 for deliveries during January-June 1966. But the price was left open for later discussion in October and November 1965. This deviation from the former practice of selling at fixed prices has been forced on the cooperative, according to its managing director, by rapid developments in production, processing, and marketing, and continuing price and wage increases.



A fillet-grading machine used in a Danish fish-filleting plant.

United States buyers of European cod fillets and fish blocks are facing higher prices and fewer supplies because of those factors. There is an increased need in Europe for fish blocks by processors, and an increased demand by consumers, in Europe and in markets as distant as Australia, for fish fillets, fish sticks and portions. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, September 22, 1965.)

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#### IMPORTS OF FISHERY PRODUCTS, 1964 AND JANUARY-JUNE 1965:

General Trends--1964: More than half of Danish imports of fishery products consist of fresh fish (mainly herring) landed by Swedish fishing craft in the Danish ports of Skagen and Hirtshals. Much of the herring is filleted and exported, especially to West Germany (table 1).

Denmark imports a large variety of canned fishery products, but the only canned items imported in significant quantities are Portuguese sardines, Pacific salmon, king crab meat, shrimp, and tuna.

landings in local ports by Danish vessels during the first half of 1965 were up 19 percent from the same period of 1964. A continuation of those trends would produce record earnings for Danish fishermen in 1965. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, August 25, 1965.)

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#### COD FILLETS AND FISH BLOCKS PRODUCTION SHORT OF EXPORT DEMAND:

The shortage of cod fillets in Denmark and the increased prices paid for them con-

## Denmark (Contd.):

Table 1 - Danish Imports of Fishery Products by Countries, 1964

Commodity	United Kingdom	Norway	Sweden	Iceland	Netherlands	West Germany	United States	Other Countries	Total of all Countries		
									Quantity	Value	
									Metric Tons	1,000 Kroner	US\$ 1,000
<b>Fresh or frozen:</b>											
Fish . . . . .	81	2,568	148,825	825	446	960	39	2,258	156,002	129,728	18,741
Shellfish . . . . .	3	281	94	2	2	9	1	18	410	3,282	474
<b>Salted:</b>											
Herring, spiced	17	471	964	2,501	371	-	-	3	4,327	8,688	1,255
Cod, wet and dry	1	541	-	262	-	-	-	367	1,171	4,619	1,255
Smoked fishery products . . . . .	1	14	-	214	-	-	1	-	230	965	139
Canned fishery products . . . . .	12	140	128	30	36	1	305	1,357	2,009	17,816	2,574
<b>Industrial:</b>											
Fish meal . . . . .	-	5,100	-	13,518	-	7	-	-	18,625	20,379	2,944
Herring oil . . . . .	-	75	-	9,784	-	1,661	-	1	11,521	15,305	2,211
Medicinal oil . . . . .	60	1,407	-	677	-	425	-	1	2,570	4,722	682
Other fish oil . . . . .	12	178	-	12	-	-	2,072	1/ 11,815	14,089	18,072	2,611
Fish offal . . . . .	219	-	-	261	1,767	21,449	-	224	23,920	9,648	1,394
Other fishery products . . . . .	731	876	34,200	29	410	4,241	101	316	40,904	16,195	2,340
<b>Total 1964 . . . . .</b>	<b>1,137</b>	<b>11,651</b>	<b>184,211</b>	<b>28,115</b>	<b>3,032</b>	<b>28,753</b>	<b>2,519</b>	<b>16,360</b>	<b>275,778</b>	<b>249,419</b>	<b>36,032</b>
<b>Total 1963 . . . . .</b>	<b>746</b>	<b>9,977</b>	<b>135,507</b>	<b>14,396</b>	<b>1,874</b>	<b>17,409</b>	<b>1,532</b>	<b>21,444</b>	<b>202,885</b>	<b>167,754</b>	<b>24,235</b>

1/Includes 11,814 metric tons of refined fish oil from Peru.

Note: Products originating in Greenland or the Faroe Islands are not included. Seaweed and agar are not included. Danish imports of seaweed in 1964 totaled 1,017 metric tons valued at Kr. 1.9 million (\$275,000) as compared to 403 tons valued at Kr. 721,100 (\$104,200) in 1963. Danish imports of agar in 1964 were 15 tons valued at Kr. 405,000 (\$58,500) as compared to 14 tons valued at Kr. 329,400 (\$47,600) in 1963.

Table 2 - Danish Imports of Fishery Products from the United States, 1964 and 1963

Table 2 - Danish Imports of Fishery Products from the United States, 1964 and 1963						
Commodity	1964			1963		
	Quantity	Value		Quantity	Value	
	Metric Tons	Kr. 1,000	US\$1,000	Metric Tons	Kr. 1,000	US\$1,000
Fresh or frozen:						
Salmon, fresh or chilled . . . . .	0.5	9.1	1.3	9.6	83.6	12.1
Salmon, frozen . . . . .	38.6	415.7	60.1	14.9	142.7	20.6
Crab. . . . .	0.4	9.2	1.3	12.9	191.4	27.6
Other . . . . .	0.3	3.4	0.5	1.8	15.8	2.3
Total fresh and frozen . . . . .	39.8	437.4	63.2	39.2	433.5	62.6
Salted:						
Salmon . . . . .	0.5	5.1	0.7	-	-	-
Smoked roe . . . . .	0.3	5.1	0.7	-	-	-
Total salted . . . . .	0.8	10.2	1.4	-	-	-
Canned:						
Salmon . . . . .	27.7	172.5	24.9	21.6	144.3	20.9
Tuna . . . . .	3.1	20.5	3.0	2.5	22.3	3.2
Shrimp . . . . .	91.6	818.6	118.3	24.1	216.2	31.2
Crab meat . . . . .	159.4	2,412.3	348.5	116.3	1,962.8	283.6
Lobster meat . . . . .	0.2	9.1	1.3	1.1	34.7	5.0
Oysters . . . . .	0.2	1.7	0.2	-	-	-
Other shellfish . . . . .	7.8	95.7	13.8	-	-	-
Other fishery products . . . . .	1.9	5.9	0.9	1.5	4.2	0.6
Total canned . . . . .	291.9	3,536.3	510.9	167.1	2,384.5	344.5
Semipreserved:						
Fish . . . . .	1.0	10.6	1.5	0.9	7.7	1.1
Shellfish . . . . .	12.6	204.2	29.5	8.1	130.0	18.8
Total semipreserved . . . . .	13.6	214.8	31.0	9.0	137.7	19.9
Industrial products:						
Fish oil . . . . .	2,072.4	2,871.2	414.8	1,221.8	1,160.9	167.7
Fish meal, etc. . . . .	-	-	-	93.5	238.7	34.5
Fish glue . . . . .	-	-	-	0.3	2.8	0.4
Total industrial products . . . . .	2,072.4	2,871.2	414.8	1,315.7	1,402.4	202.6
Other fishery products <sup>1/</sup> . . . . .	0.3	5.0	0.7	1.1	38.5	5.6
Grand total . . . . .	2,418.8	7,074.9	1,022.0	1,532.1	4,396.6	635.2

1/Includes fish eggs for hatcheries, aquarium fish, and inedible fishery products, but does not include agar and seaweed.

## Denmark (Contd.):

Fish meal and fish oils are imported in considerable quantity either for domestic consumption or re-export. Iceland is an important source of both fish meal and herring oil while Peru and the United States are the leading suppliers of fish oil other than herring.

Increasing quantities of frozen fish offal are being imported (mainly from West Germany) by Danish mink raisers. Select fish offal is an important food for mink. From 1961 to 1964, Danish imports of fish offal more than doubled in quantity and tripled in value.

Seaweed and agar imports are of some importance, although they are not included in Danish fishery statistics. In 1964, Canada and Portugal were again the leading suppliers of seaweed; Portugal and Japan, the leading suppliers of agar.

Imports from the United States--1964: Denmark's main fishery imports from the United States are fish oil, canned crab meat, frozen and canned salmon, and canned shrimp (table 2). A variety of other items are imported in small amounts.

A potential Danish market may exist for such United States products as frozen fish offal, New England tuna, and live Maine lobster. Quality would be an important factor in introducing new United States products. Frozen fish offal must compete with Canadian offerings; bluefin tuna must be dressed as soon as caught in accordance with Danish practices; and lobster must be of top quality. Frozen scallops might find a market in the Danish hotels and restaurants serving tourists. Small frozen shrimp of excellent quality might be sold if competitively priced with Danish and Greenland shrimp. The latter retail for about US\$2.08 a pound.

Imports--January-June 1965: Denmark's total imports of edible fishery products from all countries in the first half of 1965 were valued at Kr. 88.4 million (\$12.8 million), an increase of 34 percent from January-June 1964. Edible fishery imports from the United States in the first half of 1965 were valued at Kr. 2.6 million (\$375,600), an increase of 46 percent from the same period of 1964. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, August 25, 1965.)

Note: See Commercial Fisheries Review, Sept. 1964 p. 63.

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### QUALITY CONTROLS STRICT FOR IMPORTS OF FRESH FISH:

Permission granted by the Danish Fisheries Ministry to import fresh fish from other countries--place from the Netherlands, for example--to augment the short local supplies of some Danish filleters has not resulted in any substantial imports for the processors in the Jutland port of Esbjerg. Quality control inspection and regulations have turned back enough imports at the Danish border to make the business somewhat risky for the foreign suppliers. The Fisheries Ministry has consistently enforced rigid quality control regulations in its efforts to maintain the reputation of Danish fishery products. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, September 22, 1965.)

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### VERY LIGHT FIBER FOR FISHING GEAR DEVELOPED:

The Danish Firm Roblon A/S of Frederikshavn, Denmark, claims it has developed the world's lightest synthetic fiber (a split fiber from polypropylene film) for use in fishing gear.

Named "Multiflex," the new fiber is said to have high strength and flexibility with good abrasive qualities and knot properties.

"Multiflex" was exhibited for the first time at the 2nd Annual Fisheries Fair in Trondheim, Norway, August 19-29, 1965. Danish fishermen who have tested the new fiber report good results. It is expected to be useful in lines, ropes, and heavy-duty trawl netting. At present it is available in several colors in 5 to 7 kilo knotless rolls in the form of a straight fiber, twisted or cabled, from 2,000 denier up to 60,000 denier. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, August 31, 1965.)



## Ecuador

### NEW PROCESSING PLANT TO BE BUILT IN GUAYAQUIL:

The Ecuadoran Ministry of Commerce and Industries has reported that a new plant will be established in Guayaquil to freeze and can fishery products and process fish meal. Capital investment should be about \$270,000.

## Ecuador (Contd.):

It is not known whether the markets for the plant's output will be foreign, domestic, or both. Both markets for Ecuadoran fishery products, however, are in a period of growth. Tuna, shrimp, and lobster are Ecuador's most important fishery products. Should the new plant process any of those species, it is likely that some of the production would be exported to the United States. If the new plant processes such species as croaker, grunt, mullet, and sea bass, the domestic market will be the primary sales outlet.



## France

## TUNA AND SARDINE PRICE AND LANDING TRENDS, 1964:

**Prices:** In 1964, there was a small increase in average French ex-vessel prices for sardines and yellowfin tuna, but a slight decline for bluefin tuna.

French Average Ex-Vessel Prices for Sardines and Tuna, 1963-1964				
Species	1964		1963	
	Fr./Kilo	US\$/Lb.	Fr./Kilo	US\$/Lb.
Sardines . . . . .	1.66	15.4	1.52	14.1
Tuna:				
Yellowfin. . . . .	3.10	28.7	3.06	28.3
Bluefin . . . . .	4.37	40.4	4.49	41.6

Note: 4.9 French francs equal US\$1.00.

**Landings:** Sardine landings by French vessels in 1964 amounted to 23,386 metric

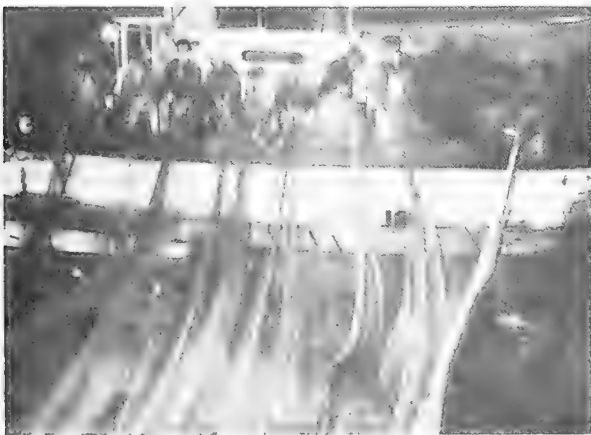


Fig. 1 - French purse seiners also fish sardines at night with lights. Aboard the French vessel *Rachel de Gâvres* near the French fishing port of Lorient, fishermen are retrieving the purse-seine net.

tons as compared to 26,129 tons in 1963 and 31,739 tons in 1962. In addition, there were landings of herring, sprat, and anchovy.



Fig. 2 - Unloading sardines in boxes at the French port of Concarneau.



Fig. 3 - A French live-bait tuna fishing vessel docked at Concarneau.

Tuna landings by French vessels in 1964 amounted to 18,486 metric tons in French ports and 10,660 tons in African ports. In 1963, the tuna landings were 15,273 tons in French ports and 10,797 tons in African ports, while in 1962 the tuna landings were 19,349 tons and 10,300 tons, respectively.

Note: A more detailed report on the French fishing industry is given in Market News Leaflet 81 (based on information supplied by the United States Embassy, Paris, France). Leaflet is available on request from the Fishery Market News Service, U. S. Bureau of Commercial Fisheries, Rm. 510, 1815 N. Fort Myer Dr. Arlington, Va. 22209.



## Ghana

### JAPANESE FIRM OFFERS TECHNICAL FISHERY ASSISTANCE TO GHANA:

Japan's second largest fishing company was expected to sign a second trawling contract with the State Fishing Corporation of Ghana to send 50 men to man two 1,850-ton Japanese-built stern trawlers to be delivered to that country by the end of 1965. The first contract of a similar nature, also involving two Japanese-built trawlers and about 50 technical people, was concluded with Ghana in August 1963. The second contract runs for 15 months, with a renewable clause. (Japan Economic Journal, August 31, 1965.)



## Greenland

### ATLANTIC SALMON FISHERY IN OFFSHORE WATERS:

A Faroese and a Norwegian vessel fishing off West Greenland in Davis Strait for Atlantic salmon with drift gill nets were not making substantial catches after that fishery started in early September 1965. The Faroese freezer vessel Dakur shifted from long-lining for porbeagle in the Northwest Atlantic. It had caught 5 or 6 metric tons of salmon while the Norwegian vessel caught about 10 tons. Reports from the Faroese vessel in the Holsteinborg area were that the area being fished may be too far north. That vessel was in port several days to modify the gill nets for surface rather than deep fishing.

Should the catch of those vessels in international waters off Greenland become substantial, it would attract many more vessels next year, if not this year, before the season ends in December. An offshore fishery might be much more productive than the inshore fishery by Greenlanders which totaled about 1,400 tons in 1964. Reports from the inshore salmon fishery are too few to date to indicate whether it will be significantly greater this season. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, September 21, 1965.)



## Hong Kong

### SHRIMP INDUSTRY AND FOREIGN TRADE, 1963-1964:

Shrimp Industry: Hong Kong's main fishing areas for shrimp trawlers, purse seiners, gill-netters, and other inshore craft are to the south of the Colony along the coast of Kwangtung Province inside the 25-fathom line. Many of those areas fall within waters claimed by the Communist Chinese Government and since 1958 fishermen based in Hong Kong have been compelled to land a portion of their catch in Mainland China as payment for their right to fish or pass through Chinese Communist waters.



The Crown Colony of Hong Kong.

As of early 1964, the Hong Kong shrimp trawler fleet numbered 1,722 craft manned by 13,776 fishermen.

Exports: Hong Kong's shrimp exports in 1963 were valued at US\$6.1 million but dropped to \$4.1 million in 1964. Japan was the principal buyer, taking 80 percent of those exports with a value of \$5 million in 1963 and \$3.4 million in 1964. The lower value in 1964 was due to strong competition from Mexican-produced shrimp which Japan has been buying. Re-exports of fishery products from Hong Kong in 1963 included fresh or frozen shrimp valued at \$1.9 million, and in 1964 the re-exports of shrimp climbed to a value of \$2.5 million.

Shrimp exports to the United States in 1963 were valued at \$254,000. But in 1964 no shrimp were exported to the United States from Hong Kong because of the Foreign Assets Control requirement of certification that the shrimp were not of Communist Chinese origin.



## Hong Kong (Contd.):

**Imports:** Hong Kong's fishery imports from the United States have remained about the same over the past five years. In 1963, they were valued at \$1.1 million and in 1964 the value was \$1.4 million, consisting mostly of canned abalone.

Communist China has been Hong Kong's major supplier of fishery products. In 1963, Hong Kong's fishery imports from that country included fresh or frozen shrimp valued at \$1.5 million, and salted, dried, or smoked shrimp with a value of \$406,000. In 1964, the value of fresh or frozen shrimp from China climbed to \$4 million and for dried shrimp the value rose to \$787,000. The 1963 shrimp imports from the Island of Macau were valued at \$1.3 million but dropped to \$879,000 the following year. (United States Consulate, Hong Kong, May 25, 1965.)

Note: Market News Leaflet 86 gives additional and more detailed information on Hong Kong's fishing industry and foreign trade in 1963-1964. Leaflet 86 is available on request from the Fishery Market News Service, U. S. Bureau of Commercial Fisheries, 1815 N. Fort Myer Drive, Room 510, Arlington, Virginia 22209.



## Iceland

## EXPORT STOCKS OF PRINCIPAL FISHERY PRODUCTS, JULY 31 AND JUNE 30, 1965:

As of July 31, 1965, Iceland's stocks of frozen groundfish (fillets) for export to the United States totaled 4,797 metric tons, a gain of 469 tons from the stocks on hand June 30, 1965. (United States Embassy, Reykjavik, September 26, 1965.)

United States imports of frozen groundfish fillets from Iceland in the year 1964 totaled

Item	Qty.	Value	
	Metric Tons	Million Kr.	US\$ 1,000
<u>Groundfish, frozen:</u>			
<u>For export to:</u>			
U. S. ....	4,797	105.5	2,450.1
Other countries ..	5,924	102.5	2,380.4
Stockfish .....	5,000	140.0	3,251.3
Herring, frozen ...	400	2.3	53.4
<u>Industrial products:</u>			
<u>Fish meal:</u>			
Herring .....	15,492	111.5	2,589.4
Other fish .....	2,381	16.1	373.9
Herring oil .....	15,917	132.1	3,067.8

Item	Qty.	Value	
	Metric Tons	Million Kr.	US\$ 1,000
<u>Groundfish, frozen:</u>			
<u>For export to:</u>			
U. S. ....	4,328	95.2	2,210.9
Other countries ..	3,806	65.8	1,528.1
Stockfish .....	6,000	168.0	3,901.5
Herring, frozen ....	631	3.6	83.6
<u>Industrial products:</u>			
<u>Fish meal:</u>			
Herring .....	16,685	120.1	2,789.1
Other fish .....	2,178	14.7	341.4
Herring oil .....	11,896	98.7	2,292.1

<sup>1/</sup>Includes only stocks intended for export.  
Note: Icelandic kronur 43.06 equal US\$1.00.

17,812 metric tons of groundfish blocks and slabs, 4,669 metric tons of cod fillets, 2,791 metric tons of haddock fillets, and 548 metric tons of ocean perch fillets.

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## EXPORTS OF FISHERY PRODUCTS, JANUARY-JUNE 1965:

During January-June 1965, there was an increase in exports of salted fish, salted fish fillets, stockfish, canned fish, frozen herring, herring oil, and herring meal, as compared with the same period in 1964, according to the Icelandic Statistical Bulletin, August 1965. Exports of frozen fish fillets, cod-liver oil, salted herring, whale oil, fish meal, and whale meal showed a considerable decrease in the first 6 months of 1965.

Product	Jan.-June 1965			Jan.-June 1964		
	Qty.	Value f.o.b.		Qty.	Value f.o.b.	
	Metric Tons	1,000 Kr.	US\$ 1,000	Metric Tons	1,000 Kr.	US\$ 1,000
Salted fish, dried .....	1,868	36,750	853	640	16,569	384
Salted fish, uncured .....	19,229	325,255	7,546	19,121	298,719	6,930
Salted fish fillets .....	1,355	23,065	535	846	11,821	274
Wings, salted .....	812	11,180	259	1,130	14,270	331
Stockfish .....	5,477	159,933	3,710	4,501	125,157	2,904
Herring on ice .....	-	-	-	19	140	3
Other fish on ice .....	17,373	105,239	2,442	16,847	96,275	2,234
Herring, frozen .....	15,773	100,081	2,322	13,106	77,806	1,805
Other frozen fish, whole ..	2,384	24,245	562	1,551	14,408	334
Frozen fish fillets .....	28,398	649,080	15,058	30,987	617,250	14,320
Shrimp and lobster, frozen	231	26,919	625	372	34,276	795
Roes, frozen .....	1,347	21,165	491	1,030	17,415	404
Canned fish .....	340	16,494	383	149	8,534	198
Cod-liver oil .....	3,063	32,046	743	6,365	56,670	1,315
Lumpfish roes, salted .....	716	37,259	864	383	9,526	221
Other roes for food, salted	1,974	32,723	759	2,606	39,053	906
Roes for bait, salted .....	525	5,994	139	1,675	14,013	325
Herring, salted .....	8,868	90,294	2,095	14,066	140,255	3,254
Herring oil .....	33,031	280,036	6,497	9,492	73,555	1,706
Ocean perch oil .....	-	-	-	28	188	4
Whale oil .....	774	6,698	155	2,101	18,675	433
Fish meal .....	14,160	93,574	2,171	22,212	138,697	3,218
Herring meal .....	34,898	241,032	5,592	31,640	178,138	4,133
Ocean perch meal .....	730	4,600	107	255	1,475	34
Wastes of fish, frozen .....	4,080	16,173	375	1,919	7,142	166
Liver meal .....	413	2,934	68	307	2,032	47
Lobster and shrimp meal ..	25	124	3	87	346	8
Whale meal .....	311	1,889	44	780	4,315	100
Whale meat, frozen .....	339	3,109	72	522	4,201	97

Note: Values converted at rate of 1 krona equals 2.32 U. S. cents.

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## Iceland (Contd.):

## FISHERY LANDINGS BY PRINCIPAL SPECIES, JANUARY-APRIL 1965:

Species	January-April	
	1965	1964
	(Metric Tons)	
Cod . . . . .	155,799	219,196
Haddock . . . . .	22,895	22,983
Saithe . . . . .	12,115	11,515
Ling . . . . .	2,385	2,636
Wolfish (catfish) . . . . .	5,412	5,699
Cusk . . . . .	1,076	2,665
Ocean perch . . . . .	6,290	5,050
Halibut . . . . .	203	280
Herring . . . . .	49,700	65,028
Shrimp . . . . .	408	89
Capelin . . . . .	49,131	8,640
Other . . . . .	1,013	1,502
Total . . . . .	306,427	345,283

Note: Except for herring which are landed round, all fish are drawn weight.

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## UTILIZATION OF FISHERY LANDINGS, JANUARY-APRIL 1965:

How Utilized	January-April	
	1965	1964
	(Metric Tons)	
Herring <sup>1/</sup> for:		
Oil and meal . . . . .	84,487	60,807
Freezing . . . . .	11,207	9,630
Salting . . . . .	3,137	3,231
Groundfish <sup>2/</sup> for:		
Fresh on ice . . . . .	15,997	15,180
Freezing and filleting . . . . .	90,367	109,003
Salting . . . . .	59,294	72,580
Stockfish (dried unsalted) . . . . .	35,944	68,610
Canning . . . . .	32	24
Oil and meal . . . . .	585	1,291
Crustacean for:		
Freezing . . . . .	287	53
Canning . . . . .	123	36
Home consumption . . . . .	4,967	4,838
Total production . . . . .	306,427	345,283

1/Whole fish.

2/Drawn fish.

Source: Icelandic Statistical Bulletin, August 1965.

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## CANNING INDUSTRY

## DEVELOPMENT TRENDS:

In the summer of 1965, a new Icelandic herring canning factory in Hafnarfjörður began production at 20 percent of full capacity. The factory produces kipper snacks under the brand name of a well-known Norwegian firm with extensive marketing outlets in the United States.

The new Icelandic factory has a 5-year contract to sell its entire production to the Norwegian firm.

The new cannery is the second Icelandic canning factory established in 1965, and it gives Iceland a total of 15 such canneries. The herring canneries in Iceland recently established a new organization, the Union of Icelandic Canning Factories, to market their products abroad, but as of September 1965, the Union was not yet functioning.

A State-owned cannery (Siglo) has experienced difficulties since its establishment 3 years ago, mainly because of marketing problems. Recently the factory made a small (250,000-can) sales contract with a firm in West Germany. Production under that contract has been delayed pending design of the cans, which will carry the label of the German firm and be marketed by the German company. The German connection is said to offer "tremendous possibilities," but price, in the face of a 30-percent tariff, may cause initial problems.

The Government of Iceland has encouraged the building of canning factories because of the substantial increase in the export value of herring and other fish and shellfish when shipped as a finished product rather than as a raw material. The Siglo cannery was built primarily to solve an unemployment problem in its area and to serve as a pilot plant for the development of a domestic canning industry.

In 1964, Iceland exported only 380.5 metric tons of canned fish, but in the first 6 months of 1965, a total of 340.2 tons were exported. Furthermore, according to advance sales contracts, it is estimated that total canned fish exports in 1965 will be over 1,000 tons. If that trend continues, fish canning may become a major industry in Iceland. (United States Embassy, Reykjavik, September 15, 1965.)



## Japan

## FROZEN TUNA EXPORTS TO U. S. AND PUERTO RICO, JUNE-JULY 1965:

Japan's exports of frozen tuna to the United States and Puerto Rico in July 1965 were up 31.6 percent in quantity and 30.2 percent in value from the previous month's exports.

Shipments of albacore tuna to Puerto Rico increased sharply in July--about triple the June shipments. Shipments to Puerto Rico

## Japan (Contd.):

Japan's Exports of Frozen Tuna by Species to United States and Puerto Rico, June-July 1965				
Species	July		June	
	Qty.	Value	Qty.	Value
	Short Tons	US\$ 1,000	Short Tons	US\$ 1,000
<b>Albacore:</b>				
United States . . . . .	4,910	1,424	6,518	1,901
Puerto Rico . . . . .	5,183	1,492	1,540	461
Total . . . . .	10,093	2,916	8,058	2,362
<b>Yellowfin:</b>				
United States . . . . .	2,361	803	1,771	559
Puerto Rico . . . . .	2,258	637	1,482	437
Total . . . . .	4,619	1,440	3,253	996
<b>Big-eyed:</b>				
United States . . . . .	-	-	57	14
Puerto Rico . . . . .	252	34	5	1
Total . . . . .	252	34	62	15
Total United States	7,271	2,227	8,346	2,474
Total Puerto Rico	7,693	2,163	3,027	899
Grand Total	14,964	4,390	11,373	3,373

Source: Japan's Bureau of Customs.

also were up for yellowfin and big-eyed tuna. (Fisheries Attache, United States Embassy, Tokyo, September 14, 1965.)

Note: See Commercial Fisheries Review, September 1965 p. 64.

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### TUNA EXPORT CONFERENCE IN NEW YORK CITY:

A two-day (September 30-October 1, 1965) Japanese Export Conference sponsored by the Japanese Ministry of International Trade and Industry and the Japan Export Trade Promotion Organization (JETRO) was held in New York City. Object was to promote and stabilize the export of Japanese products. The meeting was held in the United States to permit a direct exchange of views between Japanese tuna producers, processors, and exporters and to provide first-hand observation of market conditions in the United States. The Conference agenda included: (1) actual condition (production, imports, etc.) of the United States tuna industry; (2) present status and future outlook for Japanese canned tuna on the United States market; (3) present status and future outlook for Japanese frozen and fresh tuna for export to the United States; and (4) export promotion measures.

Fourteen members from Japan representing different segments of the tuna industry, including Government representatives, were scheduled to attend the New York conference.

Some members of the Japanese tuna delegation were planning on spending several days in the Los Angeles area (prior to the New York City conference) for meetings with resident representatives of Japanese trading firms and inspecting local processing facilities. (Katsuo-Maguro Tsushin, August 20; Kanzume Nippo, August 28; Suisan Tsushin, September 15, 1965.)

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### TUNA FLEET ACTIVITIES AND LANDINGS:

The Japanese tuna mothership Yuyo Maru (5,043 gross tons) ended fishing operations September 2, 1965, and landed 4,708 metric tons of fish, consisting of: yellowfin 1,707 tons (36 percent); albacore 1,569 tons (33 percent); other tuna 507 tons (11 percent); spearfish 443 tons (9 percent); shark 420 tons (9 percent); and other fish 72 tons (2 percent). The mothership spent 104 days on the fishing grounds near the Fiji Islands in the South Pacific.



Fig. 1 - Japanese fishing vessels fish in all the world's oceans.

The fleet's original target was 8,000 tons but this was based on over 50 catcher vessels

## Japan (Contd.):

fishing for the mothership. Actually there were only about 40 vessels, accounting in part for the lower catch. The catcher vessels averaged 2.23 metric tons of fish a day as compared to last year's average of 2.3 tons.

About 1,100 tons of the mothership's catch were transshipped to southern California on the 1,430-ton refrigerated carrier Shoyo Maru. The carrier vessel was scheduled to deliver her cargo August 27.

Twenty of the tuna long-line vessels which fished for the mothership Yuyo Maru were instructed to proceed to American Samoa to fish for one of the two American firms operating tuna canneries on that Island. The Japanese Government, which has allotted an annual production quota of about 27,000 short tons to Japanese vessels operating out of American Samoa, is said to be looking with favor on this new development, for actual landings at that base, as of early September 1965, only totaled slightly over 10,000 tons.

In August 1965, a total of 19 Japanese tuna long-line vessels landed 1,413 metric tons of fish at Penang, Malaysia, and Port Louis, Mauritius Island. In July, a total of 15 vessels landed 1,031 metric tons of fish, mainly tuna, at those two overseas bases. (Katsuo Maguro Tsushin, August 5 & 27, and September 2, 3, & 6, 1965.)

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#### TUNA LANDINGS AT YAIZU, AUGUST 1965:

A total of 11,210 metric tons of fish, primarily tuna, was landed at the Japanese port of Yaizu (leading tuna port) in August 1965 as compared to 10,102 tons for August 1964, according to data compiled by the Yaizu Fishermen's Cooperative Association. By species (August 1964 landings in parentheses): bluefin 5,908 (5,624) metric tons; albacore 654 (433) tons; skipjack 3,573 (3,451) tons; mackerel 193 (87) tons; and other species 882 (587) tons. Average prices paid per short ton for tuna in August 1965 were up significantly from the same month in 1964: bluefin US\$416, up \$124; albacore \$295, up \$8; and skipjack \$232, up 33. (Kanzume Nippo, September 3, 1965.)

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#### TUNA VESSELS OPERATING IN ATLANTIC:

According to a JETRO (Japan Export Trade Promotion Organization) report, the number of Japanese tuna long-line vessels operating in the Atlantic Ocean has increased greatly this year and as of August 1965 totaled 154 vessels. Catch per vessel had declined sharply, but the total Japanese Atlantic tuna catch is not expected to show much of a decrease due to the increase in effort. (Nihon Suisan Shimbun, August 18, 1965.)

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#### INTEREST INCREASES IN POLE-AND-LINE TUNA FISHERY:

Interest in Japan has heightened among tuna fishermen in the pole-and-line fishery for skipjack and albacore following the second successive successful season experienced by those engaged in that fishery. This revival of interest is said to be clearly revealed in the current new construction for pole-and-line vessels and in trading transactions involving fishing vessel rights.

This development represents a reversal in the trend of the early 1960's. Beginning in 1961 the peak of 540 over 50-ton pole-and-line vessels declined rapidly in the ensuing years to about 300. During that same period, the tuna long-line fishery expanded rapidly, with many new and larger vessels built. However, as a result of the generally depressive conditions faced by the long-line fishery (associated with a decline in catch rate per hook, extended vessel trips, and increased cost of operation) in the last two years or so, the fishermen's interest in long-lining for tuna has waned greatly.

One important development which has served to stabilize the pole-and-line fishery is said to be the introduction two years ago of a forced circulation salt-water bait tank, which has made possible the keeping of live bait for extended periods. This in turn has enabled pole-and-line vessels to extend their operations to the reliable skipjack grounds near the Mariana Islands and Palau Island during the winter season, thereby assuring year-round operation. During the summer, the vessels fish for skipjack and albacore off the Japanese home islands. (Suisan Keizai Shimbun, August 27, 1965.)

\* \* \* \* \*

Japan (Contd.):

#### TUNA CANNERS ADOPT MEASURES TO OVERCOME DROP IN EXPORT SALES:

The Japan Tuna Packers Association on August 7, 1965, held a directors meeting at Shimizu, to discuss measures to overcome the crisis threatening the industry as a result of substantially lower exports of canned tuna in brine to the United States. The reportedly unprecedented decline in sales had resulted in building up heavy inventories (one report estimated inventory of the Canned Tuna Sales Company at 1.5 million cases) and in burdening the canners with additional loan interest and storage expenses. The Association directors adopted the following policy:

1. From 500,000-700,000 cases of tuna in brine held in stock by the Sales Company for export during the current business year (ending November 30, 1965) will not be offered for sale. The Association's managing director will be delegated the responsibility of reducing as much as possible the packers' loan interest and storage costs for that lot.

2. Consignments to the Sales Company of canned tuna in brine for export for business year 1966 (December 1965-November 1966) will be set at 1.5 million cases (to reduce inventories to normal level).

3. A total of 50,000 cases of canned light-meat tuna were to be packed during the months of August and September in response to the request of exporting firms, which have offered to pay 100 yen (US\$0.28) more a case to packers for putting up additional quantities of the 7-oz. and 3.5-oz. packs. Note: Earlier press reports referred to 7-oz. and 13-oz. packs. (Kanzume Nippo, August 9, 1965.)

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#### TUNA PACKERS SEEK CUT IN STORAGE FEES:

Following the resolution adopted at an August 27 meeting to seek a 50-percent reduction of storage fees for canned tuna in brine for export to the United States by March 1966, representatives of the Japan Tuna Packers Association started in late August 1965 to approach warehousing firms in the Shizuoka area. The warehousing firms were reported as having replied to the Packers Association's representatives that they would schedule a meeting to discuss the Association's request. It was also reported that the warehousing

firms likely will not grant the full reduction in storage costs requested by the Packers Association. (Kanzume Nippo, September 4, 1965.)

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#### SALES OF CANNED RED SALMON REPORTED GOOD:

About 800,000 cases of Japanese canned red salmon had been shipped to Great Britain as of early July 31, 1965. Japan hopes to sell the remaining pack of red salmon by year's end.

The export price per case (48  $\frac{1}{2}$ -lb. cans) of canned red salmon was set in June 1965 by the Canned Salmon Sales Company at 155 shillings (US\$21.70) for July-August, 156 shillings (\$21.84) for September-October, and 158 shillings (\$22.12) for November-December. (Suisancho Nippo, August 7, 1965.)

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#### KING CRAB POT FISHING TEST IN BRISTOL BAY:

According to the fleet manager of the Japanese king crab factoryship Tainichi Maru (5,859 gross tons), which returned to Yokohama, September 5, 1965, fishing conditions in Bristol Bay were satisfactory this year but gear losses suffered as a result of Soviet fishing activities were extensive. (Note: U.S.S.R. operated 3 crab factoryships in the Bay area.) The Japanese fleet lost a total of about 18,000 shackles of tangle net. The manager also reported that the Japanese fleet fished crab pots (on a limited basis) for about two months to determine the suitability of that gear. As yet, definite conclusions concerning the gear's practicality have not been reached, but as many as 22 crabs per pot were taken. He stated that he hopes to conduct a pot-fishing test on a full-scale basis next year. (Suisan Keizai Shimbun, September 8, 1965.)

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#### BRISTOL BAY KING CRAB FACTORYSHIP PRODUCTION:

King crab fishing in Bristol Bay picked up considerably in late August 1965 and the Japanese king crab factoryship Tokei Maru (5,385 gross tons) was expected to meet her production target of 94,467 cases (48  $\frac{1}{2}$ -lb. cans) around August 31. The factoryship Tainichi Maru (5,859 gross tons) which met her target of 90,533 cases in mid-August arrived at Ha-

Japan (Contd.):



Japanese king crab factoryship Tokei Maru.

Yokohama, Japan, August 27. (Suisan Tsushin & Suisancho Nippo, August 28, 1965.)

Note: See Commercial Fisheries Review, October 1965 p. 82.

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#### TRAWLER ENDS GULF OF ALASKA OPERATION:

The Japanese stern trawler Taiyo Maru No. 82 (2,886 gross tons) was scheduled to return to Tokyo on August 12, 1965. The vessel, which left the Gulf of Alaska fishing grounds on July 31, caught a total of 7,500 metric tons of fish, including 6,300 tons of rockfish, 400 tons of sablefish, and 200 tons of Alaska pollock. (Suisan Keizai Shimbun, August 7, 1965.)

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#### FACTORYSHIP ENDS BERING SEA BOTTOMFISH OPERATION:

The Japanese mothership fleet led by the factoryship Chichibu Maru (7,472 gross tons) was scheduled to end operations in the Bering Sea on August 5, 1965, and to return to Kurihama around August 17. The factoryship, which began fishing January 28, was after shrimp but switched to fishing for other bottomfish as the season progressed due to the scarcity of shrimp. She was reported to have packed 1,470 cases (24 cans of 2.65 oz.) of shrimp, 1,171 metric tons of frozen shrimp, 12,374 tons of frozen rockfish, 1,792 tons of flatfish, 880 tons of black cod, and 481 tons of frozen herring.

Due to the excellent market in Japan for rockfish (average price 110,000 yen or US\$306 a metric ton) and the generally higher prices (reported to be about 20-30 percent higher than a year ago) for other species, the Chichibu Maru's operation will likely end in the black for the first time since that mothership began operating in the Bering Sea. The fac-

toryship is scheduled to be used as a refrigerated carrier for the North Pacific and Bering Sea bottomfish fleet for 90 days and was scheduled to leave Japan, September 1, 1965, on that assignment. (Suisan Tsushin, August 5, 1965.)

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#### TWO FIRMS TO CONDUCT TEST FISHING OFF SOUTH AMERICA:

Two of Japan's major fishing companies are planning to conduct test fishing in the waters off South America. One of the firms is planning to send a 500-ton trawler to the waters off the Guianas and the other firm a 1,000-ton trawler to the waters off La Plata, Argentina. Both firms have not yet submitted their plans to the Fisheries Agency for approval, but the Agency is expected to approve them when they do. (Minato Shimbun, September 3, 1965.)

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#### THREE BOTTOMFISH FLEETS OPERATING IN OKHOTSK SEA:

Three Japanese mothership-type bottomfish fleets departed for the Okhotsk Sea in mid-



Fig. 1 - Japanese factoryship Chiyo Maru.



Fig. 2 - A netload of starfish, sea snails, and other types of sea animals on the deck of the factoryship Chiyo Maru.



## Japan (Contd.):

August 1965. The fleets were led by the motherships Chiyo Maru (7,149 gross tons), Otsu Maru (8,033 gross tons), and the Takashima Maru (9,856 gross tons). The combined production target totals 27,000 metric tons of bottomfish. They are expected to remain on the fishing grounds until early October. (Nihon Suisan Shimbun, August 11, 1965.)

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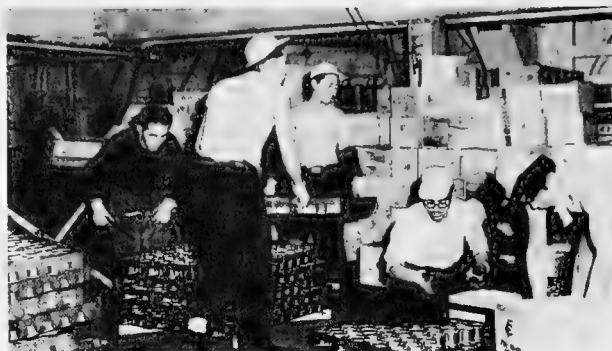
### CANNED CRAB MEAT EXPORTS, MAY-JUNE 1964-1965:

Japanese exports of canned crab meat in May-June 1965 totaled 32,549 cases (48  $\frac{1}{2}$ -lb. cans), a decline of 21 percent from the 41,077 cases shipped in the same period of 1964. The canned crab exports in June 1965 were only slightly below those in June 1964, but May 1965 shipments were insignificant.

Japanese Exports of Canned Crab Meat by Country, May-June 1964-1965					
Period and Type	United States	United Kingdom	Canada	Other Countries	Total
1965:	... (No. of Cases of 48 $\frac{1}{2}$ -Lb. Cans) ...				
May:					
King crab 1/...	-	-	-	867	867
June:					
King crab . . . .	11,810	500	-	10,085	22,395
Other crab . . . .	2,540	1,675	100	4,972	9,287
Total all species	14,350	2,175	100	15,057	31,682
May-June:					
Total all species	14,350	2,175	100	15,924	32,549
1964:					
May:					
King crab . . . .	2,241	2,550	200	1,252	6,243
Other crab . . . .	400	502	-	25	927
Total all species	2,641	3,052	200	1,277	7,170
June:					
King crab . . . .	4,385	8,800	-	5,818	19,003
Other crab . . . .	3,150	7,351	1,150	3,253	14,904
Total all species	7,535	16,151	1,150	9,071	33,907
May-June:					
Total all species	10,176	19,203	1,350	10,348	41,077
1/Only type exported in May 1965.					
Note: Japanese exports of canned crab meat other than king consist mainly of kegani and zuwai crab.					
Source: Japanese Canned Crab Sales Co.					

Compared with the same month of 1964, canned crab exports in June 1965 showed a sharp decline in sales to the United Kingdom, but much higher shipments to the United States and other countries.

King crab made up 69 percent of the June 1965 exports as compared to only 56 percent in



Inspecting and packing canned crab meat aboard a Japanese crab factoryship in the North Pacific.

June 1964. But the June 1965 exports included only 6,612 cases of kegani crab and 2,675 cases of zuwai crab as compared to 9,267 cases and 5,637 cases, respectively, in June 1964. (Fisheries Attache, United States Embassy, Tokyo, August 6, 1965.)

Note: See Commercial Fisheries Review, July 1965 p. 74.

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### EXPORTS OF FROZEN RAINBOW TROUT, JULY 1965:

Japan's exports of frozen rainbow trout in July 1965 were down 10 percent in quantity and 7 percent in value from the previous month's exports. As in June, the United States was the principal buyer of Japanese frozen rainbow trout, accounting for 56 percent in

Japan's Exports of Frozen Rainbow Trout by Country of Destination, June-July 1965				
Destination by Country	July		June	
	Qty.	Value	Qty.	Value
	Short Tons	US\$	Short Tons	US\$
United States . . . . .	112	79,731	96	71,422
United Kingdom . . . . .	29	18,994	77	46,322
Belgium . . . . .	27	22,575	26	20,803
Canada . . . . .	29	20,589	11	8,103
Australia . . . . .	1	1,114	2	1,569
West Germany . . . . .	1	569	2	1,139
Netherlands . . . . .	-	-	7	4,692
Other . . . . .	1	1,143	2	1,536
Total . . . . .	200	144,715	223	155,586
Source: Japan's Bureau of Customs.				

in quantity and 55 percent in value of the total July exports. (Fisheries Attache, United States Embassy, Tokyo, September 14, 1965.)

Note: See Commercial Fisheries Review, September 1965 p. 69.

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### CANNED MACKEREL EXPORT PRICES:

Japanese mackerel canners of eastern Hokkaido, in line with the recommendations

## Japan (Contd.):

of the Canned Mackerel Export Committee of the Hokkaido Marine Products Packers Association, agreed to the following export prices for their natural pack:

Japanese Can Size	Net Content	Price Per Case 1/
	Ozs.	US\$
No. 4	15.0	2/6.20
Flat No. 2	7.8	2/3.85

1/C. & f. Manila.

2/Prices for Sept.-Oct. 1965. For Nov.-Dec., prices were to be increased \$0.05 per case.

Source: Suisan Tsushin, August 27, 1965.

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### MACKEREL PACK AND MARKET TRENDS:

Mackerel fishing in the North Pacific off eastern Hokkaido, Japan, continued excellent. As of early September 1965, Hokkaido canners had packed an estimated 400,000 cases. Predictions were being made that they would be able to put up an additional 200,000 cases before season's end. Of the predicted total pack of 600,000 cases, about 250,000 cases were expected to be packed for export.

The packers, through their trading firms, were also reported as having offered to sell to the National Marketing Corporation (NAMARCO) of the Philippine Islands 200,000 cases of mackerel for shipment in November. It was earlier reported that they had set the following export prices for their product (c. & f. Manila): natural 15-oz. 48 cans--\$6.25 a case and natural 7.8-oz. 48 cans--\$3.90 a case. (Kanzume Nippo, September 3 & 4; Suisan Tsushin, August 27, 1965.)

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### EXPORTS OF FRESH AND FROZEN MARINE PRODUCTS, 1964:

Japan's exports of fresh and frozen marine products in 1964 were up 42.4 percent in quantity and 19.9 percent in value from the previous year's exports. In 1964, there was an increase in exports of nearly all species of tuna. The exception was skipjack for which exports were down 27.7 percent in quantity and 34.0 percent in value.

The total exports of fresh and frozen tuna in 1964 were up 19.8 percent in quantity and 20.8 percent in value as compared with 1963. The biggest increase was in exports of albacore which were up 39.4 percent in quantity

and 42.1 percent in value from the previous year.

Japan's Exports of Fresh and Frozen Marine Products, 1963-64				
Species	1964		1963	
	Quantity	Value	Quantity	Value
	Metric Tons	US\$ 1,000	Metric Tons	US\$ 1,000
<b>Tuna:</b>				
Skipjack . . . . .	3,549	560	4,909	848
Albacore . . . . .	77,136	26,739	55,318	18,811
Yellowfin . . . . .	69,427	23,049	62,633	20,552
Bluefin . . . . .	8,908	2,701	7,809	2,495
Other . . . . .	16,123	3,687	15,507	4,263
Total tuna . . . . .	175,143	56,736	146,176	46,969
<b>Swordfish (brodbill):</b>				
Steaks . . . . .	2,020	1,640	2,268	1,773
Fillets . . . . .	5,382	3,033	4,407	2,496
Other swordfish . . . . .	1,958	593	2,042	540
Total swordfish . . . . .	9,360	5,266	8,717	4,809
<b>Other Species:</b>				
Sea bream . . . . .	21,609	3,485	10,946	2,071
Yellowtail . . . . .	6	8	6	7
Mackerel . . . . .	3,004	437	2,350	351
Sardine . . . . .	11	2	39	7
Saury . . . . .	4,738	934	6,049	1,043
Salmon . . . . .	1,395	1,471	1,154	1,403
Rainbow trout . . . . .	1,965	1,683	1,384	1,315
Mackerel shark . . . . .	740	229	545	174
Other fish . . . . .	58,353	7,674	30,695	7,232
Scallop and abalone . . . . .	3	37	3	28
Oysters . . . . .	146	160	232	303
Shrimp . . . . .	1,234	1,848	1,143	1,587
Squid . . . . .	6,677	1,763	6,799	1,440
Other shellfish . . . . .	101	256	296	459
Octopus . . . . .	859	280	1,173	406
Mollusks . . . . .	10	10	4	7
Whale meat . . . . .	37,752	3,610	9,068	1,744
Frogs . . . . .	755	1,183	649	1,277
Total . . . . .	139,358	25,070	72,535	20,854
Grand total . . . . .	323,861	87,072	227,428	72,632

Source: Ministry of Finance, Customs Statistics.

Japan's 1964 exports of swordfish (including fillets and steaks) increased 7.4 percent in quantity and 9.5 percent in value over the previous year. The 1964 exports were up for other fishery products including sea bream, mackerel, rainbow trout, and whale meat. (Fisheries Attache, United States Embassy, Tokyo, March 31, 1965.)

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### TWO FIRMS TO BUILD LARGE STERN TRAWLERS FOR NORTHWEST ATLANTIC FISHERIES:

Two Japanese fishing companies have submitted applications to the Fisheries Agency to each operate a large stern trawler (to be newly constructed) in the northwestern Atlantic Ocean. The trawlers, which will be based at St. Pierre and Miquelon (French) south of Newfoundland, principally will fish for cod. The Agency will likely approve their applications.

## Japan (Contd.):

Both firms previously operated trawlers in the northwest Atlantic. One of the firms operated the 1,130-ton trawler Aoi Maru No. 2 for about 1½ years (beginning in 1962) over an extensive area in the Atlantic Ocean. The other firm operated the converted 3,698-ton stern trawler Tenyo Maru No. 3 in 1963-64.

One of the two firms is planning to construct a 1,000-ton trawler and the other a 3,000-ton vessel. (Suisan Keizai Shimbun, August 27, 1965.)

A third Japanese fishing company has decided to submit to the Fisheries Agency an application to build a 2,500-ton stern trawler for operation in the Atlantic Ocean off Africa. To meet government requirements for constructing that vessel, the firm plans to decommission a portable-boat-carrying tuna mothership. (Suisan Tsushin, September 4, 1965.)

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FISHING VESSEL CONSTRUCTION, 1960-64:

Japanese shipyards built 2,518 steel fishing vessels during the five years 1960-64, totaling 565,116 gross tons. The size of the vessels built in that period ranged from 11 to 11,193 tons.

In 1964, Japan built 502 steel vessels as against 447 licensed for construction during that year. The difference between the number of vessels built in 1964 and the number authorized for construction represents a backlog of orders that could not be met during the previous year. A total of 631 steel fishing vessels was built in 1963. (Fisheries Attache, United States Embassy, Tokyo, September 9, 1965.)

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FISHING VESSEL CONSTRUCTION LOANS ARE UP:

Japanese Agriculture-Fisheries Bank data for the period April-July 1965 show that the Bank loaned 1,635 million yen (US\$4.5 million) to 141 individuals or firms, an increase in loan value of about 10 percent over the same period a year earlier. There was a decrease in loans for the construction of tuna long-line vessels and a significant increase in loans for the construction of 190-ton skip-

jack pole-and-line vessels. (Suisancho Nippo, September 3, 1965.)

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FISHERIES AGENCY REQUESTED TO STUDY INTERNATIONAL FISHERIES PROBLEMS:

The International Fisheries Countermeasures Committee submitted on August 27, 1965, to the Japanese Fisheries Agency a request to establish a special group to study the many problems, both domestic and foreign, faced by Japan in the area of international fisheries and to develop plans to promote and stabilize the fisheries. The special committee is not expected to take up problems involving the tuna fisheries inasmuch as a special tuna study group already exists.

The Countermeasures Committee is sponsored by 12 major industry organizations in Japan, including the Japan Fisheries Society, Northern Water Mothership Council (representing firms operating motherships), Japan Whaling Association, National Federation of Fishermen's Cooperative Associations (ZENGYOREN), National Federation of Tuna Fishermen's Cooperative Associations (NIKKATSUREN), and the National Federation of Salmon Fishermen's Cooperative Associations (NIKKEIREN). (Suisancho Nippo, August 28, 1965.)

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SOVIET UNION-JAPAN POLLOCK PRICE NEGOTIATION DEADLOCKED:

The Japanese fisheries delegation and Soviet representatives (meeting in Nakhodka) are reported deadlocked over the question as to how much Japan should pay for Alaska pollock delivered by Soviet trawlers operating in the Okhotsk Sea to a Japanese firm's fish meal factoryship. The Japanese delegation is offering US\$16 a metric ton for the first 45,000 tons of fish, price to be increased \$1 a ton for each additional 5,000 tons thereafter. The Soviet Union is asking about \$5 a ton more. In January-March 1965, the Japanese firm operating the factoryship paid \$16 a ton for Soviet-caught Alaska pollock. (Suisan Tsushin, September 4, 1965.)

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APPLICATION FOR IMPORTATION OF SOVIET-PRODUCED KELP:

The Japanese kelp industry has submitted an application to the Japanese Government to

## Japan (Contd.):

import a total of 1,000 metric tons of kelp from the Soviet Union. Kelp was one of the products displayed at the Soviet trade fair held in Japan and the Soviet Union is said to be eager to export that product.

For a number of years since 1940 Japanese kelp production totaled over 90,000 metric tons a year, according to the industry's application. But as a result of having lost the territories of Sakhalin and the Kuriles, Japan's kelp production declined by 60 percent and in 1964 dropped to a low of 24,000 tons. (*Minato Shimbun*, July 30, 1965.)

Note: See *Commercial Fisheries Review*, July 1965 p. 82.



## Republic of Korea

### PLANS TO BUILD 572 FISHING VESSELS:

The Republic of South Korea (ROK) is reported planning to build a total of 572 fishing vessels under a 3-Year Plan. Of that number, the ROK plans to place an order for 259 vessels in Japan and to build 313 vessels in Korea. Types of vessels are trawlers, surrounding-net and auxiliary, tuna long-liners, refrigerated carriers, and whale catchers. The order in Japan would call for 253 vessels the first year, 5 vessels the second year, and 1 vessel the third year. Building plans in Korea call for 122 vessels the first year, 118 vessels the second year, and 73 vessels the third year.

Construction of the 572 vessels would be financed with US\$190 million to be obtained from the following sources: \$100 million from the total \$300 million in reparations owed to the ROK by Japan, plus US\$90 million from the fisheries assistance fund which Japan agreed to provide to the ROK under the normalization agreement recently concluded. (*Suisancho Nippo*, September 4, 1965.)



## Mexico

### SHRIMP EXPORTS TO EUROPE AND ASIA GRANTED TAX ADVANTAGE:

The Mexican ad valorem export tax on frozen shrimp exported to Europe and Asia will be 3.3 U. S. cents a pound less than that on

frozen shrimp exports to the United States. The discriminatory rate in favor of countries other than United States is to be effective July 9 to December 31, 1965, according to an announcement by the Mexican Government in *Diario Oficial*, August 16, 1965.

The United States is now buying over 99 percent of Mexico's frozen shrimp exports. The new export tax rates (described as a subsidy for European and Asian shipments) are expected to have very little effect on current trade. Exporters can qualify for the lower tax only if shipments are made directly from Mexican ports in Mexican vessels. At present, Mexico has only one freighter with refrigerated cargo facilities. Furthermore, it is not likely that Mexico can make much headway in the rather limited European market, which is now supplied largely from sources in the Middle East which reportedly have low production costs.

The export tax on frozen shrimp is in two forms, specific and ad valorem. The specific tax is 2.50 pesos per 100 kilograms net weight (US\$0.0091 per pound). The standard ad valorem tax had been 5 percent of the declared value, which currently is 22.50 pesos per kilogram (\$0.818 per pound), making the ad valorem tax 1.125 pesos per kilogram (\$0.0409 per pound). For direct shipments to Europe and Asia, the ad valorem tax is now reduced to one percent, with no change in the rate on shipments to the United States. Thus the combined tax for shipments to the United States is \$0.05 per pound and to Europe and Asia it is \$0.017.)

Mexico may reduce the ad valorem tax on United States shrimp shipments to 4.5 percent, but the ad valorem tax for shipments to Europe and Asia would then be cut to 0.5 percent, maintaining the 4 percent differential. (Fisheries Attache, United States Embassy, Mexico, D. F., September 15, 1965.)



## Norway

### CANNED FISH EXPORTS, JANUARY 1-MAY 22, 1965, WITH COMPARISONS:

Preliminary data show that Norway's total exports of canned fishery products in January 1-May 22, 1965, were up about 8 percent from those in the same period of 1964. The increase was due mainly to larger shipments of

## Norway (Contd.):

smoked small sild. Exports were also up for brisling, kippered herring, and sild delicatessen. But shipments were down for soft herring roe and shellfish.

Norwegian Exports of Principal Canned Fishery Products, January 1-May 22, 1965, with Comparisons		
Product	Jan. 1-May 22 1965	Jan. 1-May 23 1964
	.....(Metric Tons).....	
Brisling . . . . .	2,550	2,209
Smoked small sild . .	5,401	4,503
Kipperd herring . .	1,340	1,187
Soft herring roe . .	476	805
Sild delicatessen . .	234	183
Shellfish . . . . .	533	680
Other fishery products	1,030	1,173
Total . . . . .	11,564	10,740

In 1965, the Norwegian canning season for small sild began May 1, and the brisling canning season opened May 19. By June 12, 1965, the small sild pack was 155,278 standard cases and the brisling pack 114,858 standard cases. At the same date in 1964, it was 170,494 standard cases of small sild and 121,114 standard cases of brisling. Norwegian fishermen were disappointed by the relatively light catch of brisling and small sild during the early part of the 1965 season. (Norwegian Cannery Export Journal, July 1965.)

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### FISHERIES FAIR EMPHASIZES MODERN TECHNIQUES:

Norway's 2nd Official Fisheries Fair, held at Trondheim, August 19-29, 1965, featured the latest developments in fishing gear and electronic aids, fishing vessels and marine engines, as well as fish processing equipment. Most of the 186 exhibitors were Norwegian



Fig. 1 - A modern Norwegian purse-seine vessel. Norwegian shipyards are working actively on the international market, having built fishing vessels for countries in Asia, Africa, Latin America, and Europe.

firms. Producers from Denmark, West and East Germany, the United Kingdom, Sweden, Finland, and Poland had a total of 19 displays. Norwegian Government organizations distributed information on the development of Norwegian fisheries.



Fig. 2 - Electronic fish-finding gear aboard a Norwegian trawler. Pioneer work in developing electronic fishing aids has been done in Norway.

The Fair was attended by about 80,000 visitors. Included were visitors from Brazil, Venezuela, Cuba, the Philippines, Peru, Spain, Portugal, and Communist China, as well as from all of the major European fishing nations. The Fair provided a good opportunity for the development of export contacts.

Modern fishing techniques, production, and marketing were discussed at a 2-day conference at the Fair. There was also a special consumer section with demonstrations of how to prepare and serve fish dishes.

Several specially equipped fishing vessels called at Trondheim during the Fair. One of those, the Norwegian vessel *K.S.K.*, featured a power block, fish pump, and electronic navigating and fish-finding gear. The equipment showed the international character of the fishing industry--the power block was manufactured in the United States, the fish pump in Chile, and the electronic equipment in Japan, Germany, and the United States.

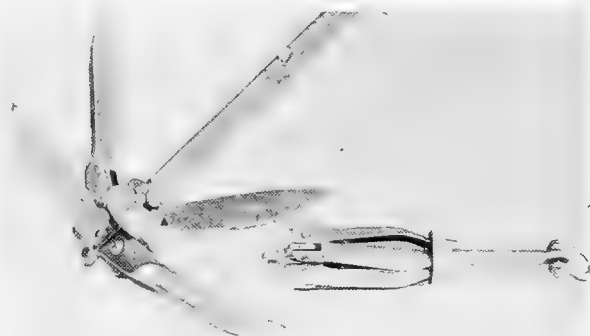
Additional information about the Fair can be obtained from the Export Council of Norway, 290 Madison Avenue, New York, N. Y. 10017. (News of Norway, September 2, 1965, and other sources.)

\* \* \* \* \*

Norway (Contd.):

### FOLDING ANCHOR PRODUCED IN NORWAY:

A folding anchor is being produced in sizes up to 33 pounds by a firm in West Norway. The four arms of the anchor can be folded on to the shaft to make a compact bundle for stowing. When needed for service, the arms are unfolded and locked in place by a sliding disc on the shaft. Successful use of the an-



At left folding anchor is extended for use. At right it is closed for stowing.

chor has been reported by Norwegian coastal fishermen, and the anchor has been awarded the "Mark for Good Design Center." (The Export Council of Norway Information Service.)



## **Peru**

### FISH MEAL SITUATION, LATE AUGUST 1965:

Peruvian fish meal output in the first half of 1965 totaled 879,000 metric tons, slightly ahead of the 870,000 tons produced in the same period of 1964. July 1965 fishing was bad, however, and production dropped to only 12,000 tons, well below the 84,000 tons produced in July 1964. Peruvian anchovy fishing was closed in August 1965 as a conservation measure.

If Peruvian anchovy fishing recovers during the important fall season, total 1965 fish meal exports may be very close to the 1964 level of 1.4 million tons since inventories were at the start of 1965 about 100,000 tons above the preceding year.

While exports may hold steady this year, prices are much higher. Some spot sales had

been made at over US\$210 per ton f.o.b. Peru. Prices declined slightly by late August 1965 with spot sales reported around \$190; November-December 1965 futures at about \$170-175; and January-June 1966 deliveries moving for around \$160. (United States Embassy, Lima, August 25, 1965.)

\* \* \* \* \*

### FISH OIL EXPORTS, JANUARY-JUNE 1965:

Peruvian exports of crude and semirefined anchovy oil in the first 6 months of 1965 totaled 86,200 metric tons, an increase of 25 percent from the 69,000 tons exported in January-June 1964. Shipments to the Netherlands in the first half of 1965 increased to 56,300 tons from 35,300 tons in the same period of 1964. Shipments to West Germany increased to 15,200 tons from 10,100 tons; and those to Colombia to 7,900 tons from 4,200 tons. (U.S. Department of Agriculture, Foreign Agriculture, September 13, 1965.)



## **Senegal**

### NINE NEW TUNA VESSELS:

Senegal's tuna fishing industry was scheduled to have 9 new vessels for the 1965/66 fishing season. Five of them were being built in France and 4 in Great Britain. It is planned to have 25 such vessels in 4 years' time.

Four fish canneries in Senegal with a present processing capacity of 11,000 metric tons of tuna annually will then have a processing capacity of 30,000 to 40,000 tons a year.

A US\$1.4 million loan by the Bank of England to Senegal for the 4 vessels being built was confirmed by an agreement in June 1964 between the Government of Senegal and Great Britain.

Note: See Commercial Fisheries Review, November 1964 p. 109.



## **South Africa Republic**

### PELAGIC SHOAL FISH CATCH, JANUARY-MAY 1965:

South Africa Republic: The Cape west coast shoal fish catch for the first 5 months of 1965 was 206,720 short tons pilchards, 30,575 tons maasbanker, 43,967 tons mackerel, 32,612 tons anchovy, and 100 tons herring.



### South Africa Republic (Contd.):

The total catch was 313,974 tons. In the same period of 1964 the total catch was 311,182 tons, made up of 223,640 tons pilchards, 19,403 tons maasbanker, 55,319 tons mackerel, 10,602 tons anchovy, and 2,218 tons hering.

South-West Africa: In the Territory of South-West Africa, the shoal catch in January-May 1965 totaled 382,201 tons and consisted of 381,917 tons pilchards and 284 tons anchovy.

Oil content of the landings in South-West Africa was averaging about 17 gallons a ton of fish. That was somewhat below the yield in 1964. The fish were plentiful and catches were only about 2½ to 4 hours sailing from Walvis Bay.

As in 1964, the factories this season have been concentrating on the production of fish meal as production for the year has been sold in advance. In addition, the entire 1965 fish oil production has been sold to the United Kingdom in advance at a price which was higher than last year.

The 1965 canning program in South-West Africa is forecast to be about the same as in 1964 when the pack of canned pilchards amounted to 62,130 short tons. Canned pilchards are finding a larger market in South Africa, and it is expected that local consumption this year will exceed one million cases. (South African Shipping News and Fishing Industry Review, July 1965.)

\* \* \* \* \*

### FISH OIL PRODUCTION, JANUARY-MAY 1965:

Production of fish-body oil in the Republic of South Africa and the Territory of South-West Africa during the first 5 months of 1965 totaled 36,951 short tons, a decline of 16 per cent from the 43,775 short tons produced in January-May 1964.

By contrast, South African fish meal production rose from 130,300 metric tons in January-May to 150,800 metric tons in January-May 1965. (U. S. Department of Agriculture, Foreign Agriculture, September 13, 1965, and other sources.)

\* \* \* \* \*

### FIBERGLASS VESSELS FOR SHOAL FISHERY PROVE POPULAR:

Orders for seven 85-foot fiberglass vessels for the pilchard fishery have been reported by the Cape Town shipbuilder that introduced fiberglass construction to the shoal fishery. Those will be the largest fiberglass vessels yet built for the shoal fishery in South African waters. Powered by a 483-horsepower diesel engine, each vessel will be specially designed to range considerable distances in search of fish. Total cost of the 7 vessels will be about R1.0 million (US\$1.4 million). The first hull is to be delivered by the end of 1965, and the others are to follow at the rate of one a month.

The builder of the new 85-foot vessels pioneered in adapting fiberglass molding techniques to the construction of larger size commercial fishing vessels. A "sandwich" method of hull construction is used. (A layer of foamed plastic is "sandwiched" between layers of glass fiber.)

The firm's earlier fiberglass vessels for the pilchard fishery, such as the 74-foot Gunfi, attracted wide interest. The firm now has an order for five new 74-foot shoal vessels as well as other orders from South African firms which will keep the shipyard busy well into 1966. The fiberglass vessels have also attracted interest in Great Britain, Norway, and other countries.

One advantage of a fiberglass vessel is that maintenance costs are less than those of other vessels, according to the managing director of the Cape Town shipyard. He said that his firm can build economically for export and claims that it is now possible to build fiberglass vessels of 100 feet or more in length. (The South African Shipping News and Fishing Industry Review, July 1965.)

Note: See Commercial Fisheries Review, Nov. 1964 p. 113; Nov. 1963 p. 79.



### South-West Africa

#### NEW FISHERIES VENTURE INVOLVES SPINY LOBSTER AND WHITE FISH:

A concession to land and process spiny lobster caught outside the 12-mile fishing limit of South-West Africa has been granted by the South-West Africa Administration to a Walvis Bay businessman. He has also obtained a li-

## South-West Africa (Contd.):

cense from the Administration to catch and process white fish. The white fish license excludes anchovy, mackerel, maasbanker, and pilchard.

The holder of the new concessions plans to organize a spiny lobster firm capitalized at R500,000 (US\$700,000) and a white fish firm capitalized at R2.5 million (US\$3.5 million). Processing plants for the two companies are to be built at Walvis Bay. Private fishing vessels are to be engaged by both companies, although the white fish company may buy and operate a few stern trawlers. Plans call for construction of the new spiny lobster plant to begin in the fall of 1965; construction of the white fish plant will be delayed until necessary processing machinery arrives in the spring of 1966.

Speaking of white fish, the sponsor of the new venture pointed out the strong export market and said, "We hope eventually to be able to handle at least 1,000 tons a month at Walvis Bay." (The South African Shipping News and Fishing Industry Review, July 1965.)



## U. S. S. R.

## TUNA FISHING TRENDS IN THE INDIAN OCEAN, MID-1965:

Early in May 1965, the Soviet tuna factory vessel Leninskii Luch completed her maiden voyage and returned to her home port at Vladivostok after a 7-months expedition to the Indian Ocean. About 800 metric tons of tuna were caught and canned. Another Soviet tuna vessel, the Krasnii Luch, also completed an Indian Ocean trip in the summer of 1965 and returned to Sevastopol on the Black Sea with 530 metric tons of tuna. The Krasnii Luch fished off the coasts of Somalia and Madagascar.

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## EXPEDITION SENT TO EXPLORE FOR TUNA, SARDINES, AND MACKEREL IN THE EASTERN PACIFIC:

In September 1965, a large group of Soviet scientists was ready to leave Vladivostok aboard 5 research vessels for a major fishery research cruise in the Eastern Pacific Ocean. Explorations from Canada to Chile are plan-

ned. The main purpose of the cruise is to discover new resources of tuna, sardines, and mackerel. The flagship of the expedition is the factory stern trawler Lira. The participating scientists are members of the Soviet Pacific Scientific Research Institute for Fisheries and Oceanography (VNIRO) and of the Leningrad Institute of Zoology. The cruise is to last over 6 months. The Soviet scientists plan to call at ports in Canada, Mexico, Chile, Western Samoa, and the Fiji Islands.

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## FAR EAST FISHERIES DEVELOPMENTS:

Soviet fishing vessels assigned to the Far East Region, beginning this summer, began to employ gill nets to harvest herring, according to a report in a Soviet periodical dated August 19, 1965. Formerly, they used surrounding nets but they were found to be effective only when dense herring schools were present. The use of gill nets has made it possible for the Far East fleet to begin fishing for herring a month earlier than usual. Also, the Soviet fleet has succeeded in mechanizing operations through the use of "net shakers" to shake out the herring from the gill nets. Some vessels operating in the northern part of the Okhotsk Sea caught from 300-400 kilograms (660-880 pounds) of herring per shackle per night set.

A Soviet factoryship assigned to the Sakhalin Administrative Province, Far East Region, reached her production target in late August 1965 and canned over 5 million cans of saury, pink salmon, and kelp. (Suisancho Nippo, September 3, and 4, 1965.)

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## EXPLORATORY CRUISE TO THE TROPICAL ATLANTIC AND THE ANTARCTIC:

An 8-months exploratory cruise to the tropical Atlantic and the Antarctic was completed in early August 1965 by the Akademik Knipovich, the Soviet Union's largest and most modern fisheries research vessel. Described as a floating laboratory, it can also operate as a stern trawler-factoryship.

Sailing from Sevastopol in December 1964 with a party of over 30 scientists, the vessel conducted research off North Africa in the spring of 1965. Exploratory fishing for tuna off Angola occupied the vessel in May 1965. The latter part of the cruise took the vessel

## U. S. S. R. (Contd.):

south to Antarctic waters and then north to the Patagonian Shelf of South America. During the past phase of the cruise, a party of scientists from Uruguay boarded the Akademik Knipovich and took part in joint research on the Continental Shelf near Uruguay.

Launched in mid-1963 and tested during 1964, the Akademik Knipovich is classified by the Soviets as a "scientific and processing" vessel. It is equipped with 12 research laboratories as well as canning and freezing equipment. The vessel returned to its home port on the Black Sea in August 1965.

Note: See Commercial Fisheries Review, Jan. 1964, p. 73, and Oct. 1962 p. 67.

\* \* \* \* \*

#### AVERAGE ANNUAL CATCH OF LARGE REFRIGERATOR-TRAWLERS:

Large refrigerated and freezer trawlers of the Soviet Union land an average annual catch of 7,500 metric tons (16.5 million pounds) and pay for themselves in 2 or 2½ years, according to the Soviet Fisheries Minister. He emphasized that the main trend in their fishing industry is development of increased automation in the catching and processing of fish. (United States Embassy, Moscow, July 22, 1965.)

\* \* \* \* \*

#### FACTORYSHIPS BUILT IN WEST GERMANY FOR SOVIETS:

The Rybatskaja Slava, first in a series of eight fish factoryships ordered by the Soviet Union from a German shipyard in Kiel, was delivered July 28, 1965, after a year of outfitting and trial runs. The Morskaja Slava, 4th of the series, and the 33rd vessel built by the German yard for the Soviet Union since 1954, was launched July 20, 1965. One of the remaining four factoryships to be built will be completed each quarter until the DM 250 million (US\$62.5 million) contract is fulfilled at the end of 1966.

The specifications of the factoryships are: capacity 16,000 gross registered tons, length 382.5 feet, main diesel engine 5,640 horsepower, and top speed 14 knots. Each is to be manned by a crew of 270.

The factoryships will pick up trawl catches either directly from the vessels or from

cod ends left floating on the sea. Designed to stay at sea almost indefinitely, the factoryships carry fuel and water for the trawlers, provide medical, dental, and recreational facilities for their crews, and process their catches into a variety of products. Each factoryship can handle 400 metric tons of raw fish daily, processing it into frozen fish fillets, canned fish, fish meal, and cod-liver oil. Up to 10,000 tons of processed fish can be stored on board. The factoryships will in turn be serviced by a fleet of refrigerated transport vessels which will deliver supplies and carry the processed fish to the Soviet Union. Reportedly the factoryships will serve in the North and South Atlantic. (United States Consulate, Hamburg, August 6, 1965.)

\* \* \* \* \*

#### FREEZER-TRAWLER "GLETCHER" DELIVERED TO SOVIETS BY DANISH SHIPYARD:

The 2,570-ton freezer-trawler M/S Gletcher was delivered to V/O Sudoimport, Moscow, by a Copenhagen shipyard, July 27, 1965. Launched November 26, 1964, the vessel is part of a series of 15 freezer-trawlers for the U.S.S.R. being built by the Danish shipyards to the following specifications: length



The 2,570-ton freezer-trawler M/S Gletcher, a refrigerator vessel that can also be used as a trawler.

between perpendiculars 91 meters (298.5 feet), breadth 16 meters (52.5 feet), and deadweight tonnage 2,550 to 2,600 metric tons. The first in the series was the M/S Skryplev launched May 10, 1962. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, August 4, 1965.)

Note: See Commercial Fisheries Review, Sept. 1965 p. 76, and Feb. 1965 p. 80.



## United Kingdom

### ATLANTIC TRAWLER CATCH RATE DECLINE FORECAST:

The Lowestoft Fisheries Laboratory of the British Government has published a report entitled Future Prospects in the Distant-water Fisheries in which the effect of increasing world fishing on Atlantic fishery stocks is forecast. The report reviews the entire Atlantic Ocean by fishing grounds as well as by major commercial species. Methods of fishing and types of vessels are also considered.

The main conclusions reached by the British scientists are:

(1) Increasing world demand for fishery products will increase the pressure on available Atlantic fishery resources and will result in decreased catch rates.

(2) Conventional side trawlers are rapidly replaced by freezer stern trawlers, factoryships, and motherships. The building of conventional side trawlers has been entirely stopped in West Germany and will soon end in the United Kingdom. A similar trend is evident in Poland, the Soviet Union, and East Germany.

(3) Few unexploited fishing grounds remain. Even the lightly fished stocks on South African and South American (Patagonian) shelves are supporting substantial catch rates. Any sharp increase in fishing effort on those shelves is bound to result in a declining catch rate. The decline may be rapid and sharp.

(4) The large increase in factoryship and mothership operations will soon lead to a rather equal distribution of catch effort per hour on all known Atlantic fishing grounds. At present catch rates, Newfoundland fishing grounds are most attractive to freezer and factory trawlers; those of Labrador and West Greenland are only slightly less attractive. An increase of fishing effort is likely to occur on all three of those fishing grounds.

(5) The total international catch is higher than ever in the Atlantic although the catch per unit of effort is falling to a level which may soon become unprofitable for the free-enterprise fishing fleets. (Fishing News, July 23, 1965, and other sources.)

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### NEW ANGLO-ARABIAN SHRIMP FISHING VENTURE IN MIDDLE EAST:

A new company to develop a shrimp fishing and processing industry in the Middle East was formed by a large British food company and a Jordanian businessman.

The headquarters of the new company will be in Bahrain in the lower Persian Gulf off the coast of Saudi Arabia where the local management will be responsible for full-scale operations before the end of 1965.

The new company has signed an agreement with officials in Saudi Arabia for exclusive rights to some productive shrimp fishing waters in the Middle East. Plans of the new company include exporting frozen shrimp to the United States. (Fish Trades Gazette, July 31, 1965.)

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### EXTENDED BRITISH FISHING LIMITS STIR PROTESTS AMONG FRENCH HERRING FISHERMEN:

In September 1965, British newspapers reported protests by French herring fishermen against Britain's extended 12-mile fishery limits (which became effective September 30, 1964). The French fishermen claimed they were excluded from certain areas within the British limits in which other nations were allowed to fish.

The situation apparently involves habitual fishing rights. Under the European Fisheries Convention, France and certain other countries were given the right to claim fishing privileges within Britain's 6- to 12-mile coastal zone, but only for the stocks and on the grounds which they had habitually fished for 10 years ending in 1963.

France and Poland were granted habitual fishing rights for herring off the British east coast north of Whitby. The French protests were said to arise from the fact that the herring schools had moved south of Whitby into an area in which the French had not habitually fished and to which, therefore, they had no right of access. (United States Embassy, London, September 15, 1965.)

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### MARINE FISH FARMING EXPERIMENTS IN SCOTTISH BAYS:

Fish farming experiments at sea are being carried out on a small scale in Scottish bays un-

## United Kingdom (Contd.):

der the sponsorship of the British White Fish Authority. Some 200,000 young plaice of postage-stamp size, artificially hatched and reared at Port Erin, Isle of Man, have been released into a 5-acre holding pond at Ardtoe on the coast of Northern Argyll. Among the problems encountered have been the depredations of small crabs. (The crabs are being trapped.) More serious is an excessive influx of fresh water from the surrounding hills. The White Fish Authority emphasized that the object of the experiment in its early stages was to identify and attempt to overcome problems such as those.

In July 1965, a spokesman for the Authority said that Scottish bays were well suited for such experiments. He pointed out that increased fishing and an increasing demand for fish in the future could cause scarcities. Fish farming at sea might be one solution to the problem. He said that scientific experiments of recent years give hope that fish farming at sea may become a reality not too many years from now. (*Fishing News*, London, July 16, and August 20, 1965.)

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SMALL VESSEL DESIGN RECOMMENDATIONS FOR STABILITY AND ECONOMY:

Papers on the design, construction, and operation of small fishing vessels were given at a conference held in Newfoundland, Canada. Among the contributors was a specialist from the National Physical Laboratory, Teddington, England, who commented on British fishing vessels in relation to stability and economy of operations.

Fishing vessels of all types, he said, had traditionally earned a good reputation for seaworthiness and the ability to work in diverse weather conditions. Technically, the relatively high speed of fishing vessels in relation to their short length has made them of special hydrodynamic interest.

The wave-making resistance of fishing vessels is therefore of more than average importance. Relatively minor changes in hull form and dimensions may require radical changes in power and length.

As a result of studies which have been made of vessels under 100 feet in length, the British designer claims that it is possible to

predetermine to a large extent the best underwater hull form and dimensions for specified operating conditions, and to assess the quality of performance of any vessel in relation to optimum result.

A relatively large scope for improvement in many traditional designs of fishing vessels is very possible, he said, using those techniques.

The British designer said there were clear indications that fishing vessels were being built beyond the economic lengths and speeds which could be justified on the current fish-catching rates.

He based that conclusion on design theory as well as on a survey of British fishing vessels. For example, an increase of speed beyond about 15 knots resulted in diminishing increases in fishing time. Although increasing the speed beyond 15 knots did increase the ratio of fishing time to voyage time, and also reduced the length of the voyage, the corresponding power required to maintain those higher speeds was generally excessive and produced high fuel and maintenance costs.

In an effort to reduce resistance and power requirements per ton of displacement, larger vessels up to 190 feet between perpendiculars had been built by some owners at extra capital cost. But those larger vessels had to catch far greater quantities in the same time if they were to give the same economic return, and they had not done so since fish catching rates were not significantly greater for the larger vessels with the present type of gear.

Accordingly, the British expert thought there was likely to be a sustained requirement for well designed stern trawlers of between 130 and 150 feet between perpendiculars. (*Fishing News*, July 30, 1965.)

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LIGHTWEIGHT PLASTIC FISH BOXES TO BE PRODUCED:

Lightweight plastic fish boxes are to be produced by one of the largest plastic-molding machines ever built in Great Britain. The machine can produce moldings weighing up to 30 pounds. The fish boxes will be molded in high density polythene, each weighing  $8\frac{1}{2}$  pounds and holding about 112 pounds of fish and ice.

# United Kingdom (Contd.):

The machine was designed by a Bourne-mouth engineering firm and is being built at a factory in Birmingham. (Fish Trades Gazette, July 24, 1965.)

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## OCEANOGRAPHIC CRUISE TO USE "SOUND PICTURES" TO STUDY PLANKTON:

An oceanographic cruise to study plankton was begun in early September 1965 when biologists and physicists from several nations sailed from Plymouth, England, aboard the research vessel Discovery III for a 3-months cruise in the Atlantic. The cruise is a cooperative effort involving scientists from the United States, Brazil, and Portugal, as well as the United Kingdom. The U. S. National Science Foundation contributed funds to help outfit the cruise. Echo-sounding devices are the main tool being used during the investigation. (Editor's Note: According to previous reports, British scientists have developed an underwater "sound wave searchlight" that gives a much more detailed picture of the underwater world than traditional echo-sounding equipment.)

Scientists aboard the Discovery III hope to gain a better understanding of the way in which various types of plankton layers reflect sound. One of their objectives is to develop improved techniques of identifying different types of plankton layers with echo-sounding devices. A better understanding of the layers could tell much about the distribution and behavior of the tiny sea animals and plants (plankton) which are a primary source of food for all marine life. It is probable that some layers would also be a useful index of internal waves and other aspects of the physical structure of the ocean.

Studies of the relation of plankton and light were also scheduled during the cruise of the Discovery III. Some of the scattering layers are known to alter their depth in relation to the intensity of light, so attempts will be made to influence plankton movement with artificial light. The frequency and intensity of the responses of the eyes of the various organisms in the scattering layers will be studied, and measurements will be made of the light generated by luminescence of the organisms.

During the cruise, echo-sounders will operate at seven different frequencies and the

scale of each will be determined so that some measure of quantity can be given to the sound reflections from organisms. A blending device will make it possible to obtain some measure of the patchiness of sound reflections at any given frequency and to compare the total intensity of scattering in a selected plankton layer in different positions. Records will also be taken on high-speed recorders. (Fishing News, London, September 10, 1965.)

Note: See Commercial Fisheries Review, January 1965 p. 96.



# Uruguay

## FISHERIES PROJECT PROPOSED BY BULGARIA:

Bulgaria is said to have offered to build fish-canning and cold-storage plants in Uruguay. The installations would be paid for by Uruguayan shipments of agricultural products to Bulgaria. Uruguay doesn't appear to have the fishing capability to take full advantage of the offer. If built, however, the plants might give Bulgaria, or another Soviet Bloc country, a base for fishing operations on the Patagonian Shelf of South America. Production facilities might also create a market for fishing vessels in Uruguay.



# Venezuela

## JAPAN REDUCES HOLDING IN JOINT TUNA ENTERPRISE:

The vice-governor of Chiba Prefecture revealed in late August 1965 that the Chiba Prefectural Fisheries Promotion Company has relinquished management of the joint Japanese-Venezuelan tuna fishing enterprise (Flota Pesquera de Alta Mar Company) by reducing its stock holdings to about 3 percent. The joint company was established in August 1959 with Japan contributing 49 percent and Venezuela 51 percent of the investment capital. (Suisancho Nippo, September 2, 1965.)

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## SHRIMP INDUSTRY OPPOSES ENTRY OF FLORIDA FIRM:

Venezuelan opposition has been building up against a proposal by a Florida company to establish a modern shrimp packing plant in Zulia State in Western Venezuela. Packers in Vene-



## Venezuela (Contd.):

zuela have obtained support from State agencies, local and national labor groups, and some trade associations for their plea to ex-

clude the planned operation. The local groups insist that the national shrimp industry would be jeopardized by the proposed new company. (United States Embassy, Caracas, September 18, 1965.)



## SHRIMP-VEGETABLE PLATTER

There are certain old "dowagers" among the sauces--those that derive their thickening from a flour paste. Then there are the aristocrats of sauces that get their stamina from eggs. Some of the latter, such as hollandaise, are thickened by heating; others, of which mayonnaise is the best known, are thickened by beating or whipping. This savory mustard sauce for shrimp falls into the latter category. Many cooks shy away from sauces of this type, but in truth they are the easiest of all because the whole operation requires only one bowl. Mustard sauce makes an excellent accompaniment for this shrimp and vegetable platter.

SHRIMP-VEGETABLE PLATTER  
WITH TARRAGON MUSTARD SAUCE

- |   |  |
|---|--|
| 1½ pounds frozen peeled and deveined shrimp | 1 package (10 oz.) frozen whole baby carrots |
| 1 package (10 oz.) frozen Brussels sprouts  | 2 cups sliced celery                         |
|   | 1 (1-lb.) can whole potatoes                 |

Cook shrimp in boiling salted water to cover for 3 to 5 minutes or until bright pink and tender. Meanwhile, cook frozen Brussels sprouts and frozen carrots as directed; cook celery in boiling salted water until tender. Heat potatoes.

Arrange shrimp in a cross on a large chop plate. In each "V" of the cross, place one of the drained vegetables. Serve with Tarragon Mustard Sauce. Makes 6 servings.

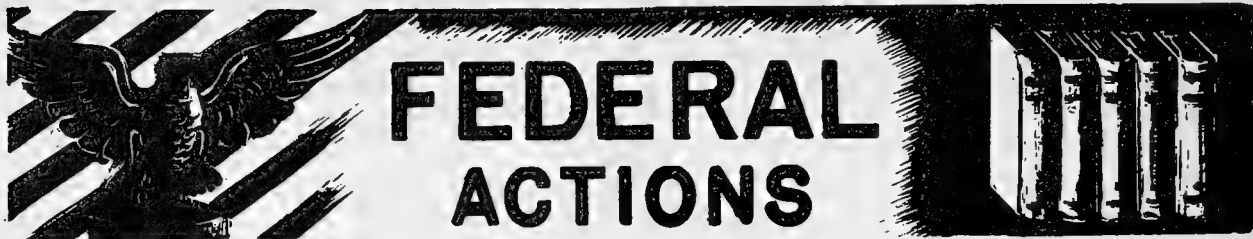


Shrimp and vegetable platter with tarragon mustard sauce.

Tarragon Mustard Sauce

- |                                  |                           |
|----------------------------------|---------------------------|
| 2 tablespoons dry mustard        | 1 cup salad oil           |
| 6 tablespoons white wine or beer | 2 tablespoons lemon juice |
| 2 egg yolks                      | ½ teaspoon salt           |
| 2 tablespoons dried tarragon     |                           |

Mix mustard and wine or beer to make a smooth paste. Let stand at room temperature for 10 minutes to develop flavors. Beat in egg yolk with wire whisk. Add oil gradually, beating vigorously. Add lemon juice, salt, and tarragon; chill. Garnish with fresh tarragon. (J. Walter Thompson Co., New York City, and Shrimp Association of the Americas.)



## Department of Commerce

### AREA REDEVELOPMENT ADMINISTRATION SUCCEEDED BY THE ECONOMIC DEVELOPMENT ADMINISTRATION:

On August 31, 1965, the Area Redevelopment Administration (ARA) ceased operations and was succeeded by a new Federal agency, the Economic Development Administration (EDA). As was the case with ARA, the new agency will function as a unit of the Department of Commerce. The new agency will administer a greatly expanded program of public works loans and grants, industrial and commercial loans, and technical assistance to promote economic development of depressed communities and regions across the country. (U. S. Department of Commerce, August 31, 1965.)



## Department of Health, Education, and Welfare

### FOOD AND DRUG ADMINISTRATION

#### PROPOSAL TO USE SODIUM NITRITE AS A PRESERVATIVE AND COLOR FIXATIVE IN CANNED CRAB MEAT:

A petition (FAP 6A1829) has been filed by a firm in Port Royal, S. C., proposing an amendment to the regulations of the U. S. Food and Drug Administration governing the use of sodium nitrite as a food additive. The petition proposes the "use of sodium nitrite as a preservative and color fixative in canned crab meat at a level not to exceed 250 parts per million." The petition was published in the Federal Register, August 31, 1965.



## Department of the Interior

### FISH AND WILDLIFE SERVICE

#### BUREAU OF COMMERCIAL FISHERIES

#### FISHERY LOAN APPLICATION RECEIVED FOR PURCHASE OF SALMON VESSEL:

Michael J. Carr, Mercer Island, Wash., has applied for a loan from the U. S. Fisheries Loan Fund to aid in financing the purchase of a new 32-foot wood vessel to engage in the fishery for salmon.

Regulations and procedures governing fishery loans have been revised and no longer require that an applicant for a new or used vessel loan replace an existing vessel (Public Law 89-85; Fisheries Loan Fund Procedures--50 CFR Part 250). Complete details of the regulation changes were published in the Federal Register, August 11, 1965.

In accordance with the revised regulations, notice of the application was published in the Federal Register, September 28, 1965. Persons desiring to submit evidence that the contemplated operation of such vessel will cause economic hardship or injury to efficient vessel operators already operating in the salmon fishery were to submit such evidence in writing to the Director, U. S. Bureau of Commercial Fisheries, Washington, D. C., by October 28, 1965.

Note: See Commercial Fisheries Review, October 1965 p. 104.

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#### HEARINGS ON APPLICATIONS FOR FISHING VESSEL CONSTRUCTION DIFFERENTIAL SUBSIDY:

Star-Kist Foods, Inc., Terminal Island, Calif., has applied for a fishing vessel construction differential subsidy to aid in the construction of a 149-foot overall steel vessel to engage in the fishery for tuna, mackerel, sardines, hake, and anchovies. A hearing on the economic aspects of this application was held.

B. J. Litrico, Tampa, Fla., has applied for a fishing vessel construction differential subsidy to aid in the construction of a 90-foot aluminum vessel to engage in the fishery for shrimp (including royal-red shrimp), spiny lobster, scallops, and Atlantic tuna. A hearing on the economic aspects of this application was held.

The U. S. Bureau of Commercial Fisheries published the notices of the applications and hearings in the Federal Register, September 11, 1965.

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#### CONTRACT AWARDED FOR RESEARCH TO IMPROVE PROCESSING TECHNIQUES FOR ALASKA SEAL SKINS:

A one year contract for a research program designed to make Alaska seal skins more attractive to the public by improving processing techniques has been awarded the Pierre Laclede Fur Company, St. Louis, Mo., announced Secretary of the Interior Stewart L. Udall, September 2, 1965.

That firm will work to develop fur-seal products different from those that have been available. It will seek better ways to dress the leather, develop a variety of colors, improve shearing and other processing techniques, and fashion new luxury fur products. Within 60 days after completing its work, the company will prepare a technical report of its findings. Information on useful new methods will be made public by the Department of the Interior.

Interior's Bureau of Commercial Fisheries manages and harvests the fur seals of the Pribilof Islands, 300 miles off the Alaskan coast in the Bering Sea, and cures the skins before shipping them to a processor. The estimated cost to the Government for performance of the Laclede contract is \$377,000, said that Bureau's director. He said the Government will provide the company 5,000 skins--two-thirds male and one-third female--for research and development purposes. The company's production targets are about 4,000 dressed, dyed and machined furs, and about 1,000 sheared furs. All skins remain the property of the U. S. Government and ultimately will be sold at auction.

On March 31, 1965, the Secretary of the Interior announced the award of a 5-year contract to the Fouke Fur Company of Green-

ville, S. C., for the processing and sale of seven-eighths of the seal skins harvested during the years 1963 through 1967. At the same time, he said the Department would use one-eighth of the skins harvested during the period for experimental processing contracts with other interested firms. The contract with the Pierre Laclede Fur Company is the first of its kind negotiated by the Interior Department.

The Pribilof Islands are the only breeding grounds of the Alaska fur-seal herd, which numbers between 1.5 million and 2 million, and represents more than 80 percent of the world's fur seals. The young are born each summer on the rocky beaches. In the fall, after the breeding season, the seals return to sea. Other seals of the same species breed at rookeries on islands off the coasts of Russia and Japan. Those rookeries are administered by the Soviet Union.

Experts consider the present size of the Alaska herd ideal for its survival and well-being. Each year, the United States harvests about 70,000 surplus young animals, of which about 50,000 processed pelts are sold for the United States account. In 1963, gross sales of seal skins brought \$6,066,268. The State of Alaska receives 70 percent of the net proceeds from the semiannual fur-seal auctions.

Under terms of the North Pacific Fur Seal Convention of 1957, Canada and Japan each receive 15 percent of the annual separate harvests of the United States and the Soviet Union.

Note: See Commercial Fisheries Review, July 1965 p. 101.



## Department of Labor

WAGE AND HOUR AND PUBLIC CONTRACTS DIVISIONS

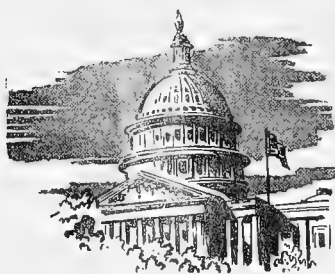
#### FISH FARMING ENTITLED TO AGRICULTURAL EXEMPTION UNDER FAIR LABOR STANDARDS ACT:

The agricultural exemptions applicable under the Fair Labor Standards Act to employees engaged in fish farming were clarified by amendments to the Code of Federal Regulations, Title 29--Labor, Part 780--Exemption Applicable to Agriculture, Processing of Agricultural Commodities, and Related Subjects. The amendments as published in the Federal Register, August 10, 1965, include

fish farming activities within the scope of the meaning of "farming in all its branches." The amendments became effective upon publication. In essence, employees engaged in propagating or farming of fish qualify for exemption from the minimum wage and overtime provisions under section 13(a)(6) of the Fair Labor Standards Act as stated in section 780.118 as well as under section 13(a)(5) as explained in Part 784 of this same chapter.



## Eighty-Ninth Congress (First Session)



Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House

and Senate, as well as signature into law or other final disposition are covered.

**ANADROMOUS FISH CONSERVATION:** House Committee on Merchant Marine and Fisheries, Sept. 15, 1965, reported (H. Rept. 1007) on H. R. 23, to authorize the Secretary of the Interior to initiate a program for the Conservation, development, and enhancement of the Nation's anadromous fish in cooperation with the several States, with amendment; to Committee of the Whole House on the State of the Union.

H. Rept. 1007, Authorizing the Secretary of the Interior to Initiate a Program for the Conservation, Development, and Enhancement of the Nation's Anadromous Fish (Sept. 15, 1965, report from the Committee on Merchant Marine and Fisheries, House of Representatives, 89th Congress, 1st session, to accompany H. R. 23), 24 pp., printed. Committee reported bill favorably with amendments. Presents purpose, need for legislation, background, section-by-section analysis, cost, changes in existing law, and departmental reports.

House Sept. 20, 1965, amended and passed H. R. 23. As passed would provide a 5-year program (spending over that period \$25 million of Federal money to be equally matched by State or private agencies) to clear streams, study habitat and resources, build fishways, and accomplish other necessary actions to provide for the restoration of the fish. The title was amended: "To authorize the Secretary of the Interior to initiate with the several States a cooperative program for the conservation, development, and enhancement of the Nation's anadromous fish, and for other purposes."

On Sept. 21, 1965, the House-passed H. R. 23 was referred to the Senate and its Committee on Commerce.

Senate Committee on Commerce, Oct. 8, 1965, ordered favorably reported with amendments H. R. 23, and reported (S. Rept. 860) it to Senate Oct. 11.

**AQUATIC PLANT CONTROL:** H. Doc. 251, Expanded Project for Aquatic Plant Control: Letter from the Secretary of the Army, transmitting a letter from the Chief of Engineers, Department of the Army, Dated June 2, 1965, Submitting a Report, Together with Accompanying Papers and Illustrations, on Expanded Project for Aquatic Plant Control, Authorized by Section 104 of Public Law 85-500, 85th Congress, approved July 3, 1958, referred to Committee on Public Works, House of Representatives, 89th Congress, 1st session, July 28, 1965, 161 pp., illus., printed. Contains favorable report from the Army Chief of Engineers. Besides the report of the division engineers (giving authority, description of harbors, problem, existing projects, analysis of benefits, analysis of remaining problems, conclusions and recommendations), it contains comments from various Federal agencies, and States of South Carolina, Alabama, Mississippi, and Louisiana. The report describes the results which have been obtained and recommends that authorization be granted to the Corps of Engineers for continued and expanded work in the control of obnoxious aquatic plants. It is a summary of accomplishments under the Expanded Project for Aquatic Plant Control which was authorized as a pilot program for a five-year period in July 1958 for a study of control of certain obnoxious aquatic plants in the States of Texas, Mississippi, Louisiana, Alabama, Florida, Georgia, South Carolina, and North Carolina. This project was carried out in cooperation with the States, the Agricultural Research Service of the Department of Agriculture, Fish and Wildlife Service of the Department of the Interior, and the Public Health Service of the Department of Health, Education, and Welfare. Includes a recommendation that Section 104, Public Law 85-500, 85th Congress, as amended, be further amended to authorize the Secretary of the Army to carry out in cooperation with the States and appropriate Federal agencies a continuing program for the control of obnoxious aquatic plants wherever and whenever infestations of such plants constitute a serious threat to navigation, agriculture, public health, the efficiency of drainage and flood control works, or the use of the Nation's waterways.

**CEDAR RIVER HARBOR, MICHIGAN:** H. Doc. 248, Letter from the Secretary of the Army, transmitting a letter from the Acting Chief of Engineers, Department of the Army, Dated June 29, 1965, Submitting a Report, Together with Accompanying Papers and a Illustration, on a Review of the Report on Cedar River Harbor, Michigan, requested by resolutions of the Committees on Public Works, United States Senate and House of Representatives, Adopted July 20, 1959 and August 14, 1959 (referred to the Committee on Public Works, House of Representatives, 89th Congress, 1st session, July 26, 1965), 73 pp., printed. Contains report from Acting Chief of Engineers on Cedar River Harbor, Mich., improvements. Besides the report of the district engineer (giving authority, scope, description, improvements desired, plan of improvement), it contains comments from various Federal Agencies, State of Michigan, and report from Board of Engineers for Rivers and Harbors. Among others, discusses benefits for commercial and sport fishing.

**COMMODITY PACKAGING AND LABELING:** Fair Packaging and Labeling: Hearings before the Committee on Commerce, United States Senate, 89th Congress, 1st session, on S. 985, a bill to regulate interstate and foreign commerce by preventing the use of unfair or deceptive methods of packaging or labeling of certain consumer commodities distributed in such commerce and for other purposes, Apr. 28, 29, 30; May 3, 4, 5, 6, 7, 17, and 18, 1965, Serial 89-28, 868 pp., illus., printed. Contents include text of bill; agency comments; statements, letters, and telegrams of various business representatives and members of Congress.

**CRESCENT CITY HARBOR, CALIFORNIA:** H. Doc. 264, Letter from the Secretary of the Army, transmitting a letter from the Acting Chief of Engineers, Department of the Army, Dated June 30, 1965, Submitting a Report, Together with Accompanying Papers and Illustration, on an Interim Report on Crescent City Harbor, California, requested by a resolution of the Committee on Public Works, House of Representatives, Adopted July 31, 1957 (referred to Committee on Public Works, House of Representatives, 89th Congress, 1st session, Aug. 16, 1965), 107 pp., printed. Contains report from the Acting Chief of Engineers, on a review of the reports on Crescent City Harbor, Calif., improvements to facilitate navigation. Besides the report of the district engineer (giving authority, scope, description, tributary area, commerce, plan of improvement, shoreline changes, estimates of cost, and benefits, it contains comments from various Federal Agencies, State of California, and reports from Board of Engineers for Rivers and Harbors. Among others, discusses benefits for commercial and sport fishing. District Engineer points out that improvement is needed to deduce damages to lumber and fishing vessels, etc.

**FISH AND WILDLIFE:** Miscellaneous Fisheries and Wildlife Legislation 1965: Hearings before the Subcommittee on Fisheries and Wildlife Conservation of the Committee on Merchant Marine and Fisheries, House of Representatives, 89th Congress, 1st session, on Fisheries Loans, H. R. 4227, H. R. 5153, H. R. 6090, H. R. 6101, H. R. 6362 and H. R. 6921, May 27, 1965, . . . ; Pesticide Controls, H. R. 4157, H. R. 4158 and S. 1623, June 22, 1965, . . . ; Serial No. 89-11, 230 pp., printed. Contains text of the bills, agency reports, and statements of various Federal and State officials, representatives of various business firms, associations, etc.

**FOOD STANDARDS--CODEX ALIMENTARIUS COMMISSION:** Sen. Thurmond on Oct. 6, 1965, pointed out in Congressional Record (pp. 25188-25190) that the Codex Alimentarius Commission was established in 1962 under the auspices of the United Nations Food and Agricultural Organization and the World Health Organization for the purpose of devising an international set of standards for food. There are now 45 of the some 100 eligible nations participating in drawing up this code. The work of the Commission is highly important--not only as a means of improving the quality of food for consumers but also as a means of discouraging arbitrary standards as barriers against imports of food products, including imports of U. S. food products. Although the standards will not have legal status when they are adopted by the Commission, they can be expected to exercise a strong influence on the form of national food laws around the world and in discouraging their use as nontariff trade barriers. He also inserted the article: "Standards for Food: A Uniform World Code Is Nearer Despite Some Disputes," published in the Wall Street Journal of Oct. 6. It discusses the work of the Commission; points out that the Commis-

sion is directing its attention to all kinds of standards, not only those relating to the quality of types of food products, but to labeling, methods of analysis, food additives, food hygiene, sampling, and pesticide residues.

**FUR SEAL CONSERVATION AND PRIBILOF ISLAND ADMINISTRATION:** The subcommittee on Foreign Aid Expenditures of Senate Committee on Government Operations, Sept. 23, 1965, held hearings to review administration of fur seal skin operations in the Pribilof Islands, Alaska. Testimony was received from the Director of the Bureau of Commercial Fisheries, Department of the Interior, who was accompanied by his associates.

**HALIBUT COMMISSION:** House Committee on Merchant Marine and Fisheries, Sept. 15, 1965, reported (H. Rept. 996) on H. R. 9734, to amend the Northern Pacific Halibut Act in order to provide certain facilities for the International Pacific Halibut Commission, without amendment; to Committee of the Whole House on the State of the Union.

H. Rept. 996, Offices for the International Pacific Halibut Commission (Sept. 14, 1965, report from the Committee on Merchant Marine and Fisheries, U. S. House of Representatives, 89th Congress, 1st Session, to accompany H. R. 9734), 7 pp., printed. Committee reported bill favorably without amendment. Discusses purpose, background and need for legislation, cost, departmental reports, and changes in existing law.

House Sept. 20, 1965, passed H. R. 9734. House then considered and passed a similar Senate-passed bill, S. 975. Proceedings for passage of H. R. 9734 were vacated and bill was laid on the table. This action cleared S. 975 for the President. Authorizes construction of quarters for the Commission on or adjacent to the University of Washington campus; authorizes up to \$500,000 for the construction.

The President Oct. 1, 1965, signed S. 975 (P. L. 89-233).

**HEALTH, EDUCATION, AND WELFARE APPROPRIATIONS, FY 1966:** Labor-Health, Education, and Welfare Appropriations for 1966: Hearings before the Subcommittee of the Committee on Appropriations, United States Senate, 89th Congress, 1st session on H. R. 7765, making appropriations for the Departments of Labor and Health, Education, and Welfare, and related agencies, for the fiscal year ending June 30, 1966, and for other purposes. Part 1 (Thursday, Mar. 4, 1965, through Monday, March 22, 1965), and Part 2 (Tuesday, Mar. 23, 1965, through Wed., June 23, 1965), 2,780 pp., printed. Includes statements and budget summaries from the agencies covered, as well as statements from outside witnesses. Includes funds for botulism research under the Food and Drug Administration; water pollution control under Office of the Secretary; pesticide activities, water supply and water pollution control, shellfish sanitation program, and botulism under the Public Health Service.

H. Rept. 791, Departments of Labor, and Health, Education, and Welfare, and Related Appropriation Bill, 1966 (Aug. 12, 1965, report from the Committee of Conference, U. S. House of Representatives, 89th Congress, 1st session, to accompany H. R. 7765), 8 pp., printed. Contains Committee recommendations and statement of the managers on the part of the House.

**INLAND GREAT LAKES AND WESTERN RIVERS RULE FOR SMALL VESSELS:** S. Rept. 675, Changing

Inland, Great Lakes, and Western Rivers Rules, Sept. 2 (legislative day, Sept. 1), 1965, report from the Committee on Commerce, U. S. Senate, 89th Congress, 1st session, to accompany S. 1349, 4 pp., printed. Committee reported bill favorably without amendments. Presents purpose, legislative background, a general statement, costs, agency reports, and changes in existing law.

INTERNATIONAL ORGANIZATIONS: H. Doc. 229 (Letter from the Secretary of State, transmitting the 13th Report on the extent and disposition of U. S. Contributions to International Organizations for the Fiscal Year 1964, pursuant to Section 2 of Public Law 81-806; June 28, 1965 referred to Committee on Foreign Affairs, House of Representatives, 89th Congress, 1st session), 154 pp., printed. Lists U. S. contributions to international organizations from fiscal year 1964 funds. Includes a number of international fisheries commissions.

JELLYFISH-CONTROL ELIMINATION IN COASTAL WATERS OF U. S.: Introduced in House H. R. 11475 (Garmatz), Oct. 7, 1965, and H. R. 11507 (Machen), Oct. 8, 1965, to provide for the control of elimination of jellyfish and other such pests in the coastal waters of the United States; to Committee on Merchant Marine and Fisheries. Rep. Garmatz pointed out that bill would authorize the Secretary of the Interior to cooperate with the States and give financial and technical aid to them in the study and control of jellyfish (sea nettles) and other such pests which adversely affect fish and shellfish as well as water-based recreation. The Secretary would be authorized to conduct, either directly or by contract, or both, research into the jellyfish problem, to conduct studies on developing control measures, and, based on such studies, to control or eliminate such pests in our coastal waters and tributaries. The cost of this legislation would be shared by the States on a 50-50 basis, with the Federal share of the program being limited to \$10 million.

MARINE BIOLOGICAL LABORATORY: House Committee on Merchant Marine and Fisheries Sept. 16, 1965, ordered reported favorably to the House S. 1735, to set forth limitations on the use of certain land donated by the University of California for a marine biological laboratory.

METRIC SYSTEM STUDY: Conversion To Metric System: Hearing before the Committee on Commerce, United States Senate, 89th Congress, 1st session, on S. 774, a bill to provide that the Department of Commerce shall conduct a program of investigation, research, and survey to determine the practicability of the adoption by the United States of the metric system of weights and measures, July 14, 1965, Serial No. 89-27, 72 pp., printed. Contents include text of bill, agency comments, statements and letters of various Federal officials, Senators, and representatives of various business firms and associations.

The Metric System: Hearings before the Committee on Science and Astronautics, U. S. House of Representatives, 89th Congress, 1st session, on H. R. 2626 superseded by H. R. 10329, Aug. 2, 3, 4, 5, and 9, 1965, No. 4, 134 pp., printed. Contains testimony of various Federal officials, Congressmen, and representatives from various associations. Would provide that the National Bureau of Standards shall conduct a program of investigation, research, and survey to determine the practicability of the adoption by the

United States of the metric system of weights and measures.

Senate Committee on Commerce Sept. 16, 1965, ordered favorably reported S. 774; same day Committee reported (S. Rept. 751) it to Senate.

S. Rept. 751, Study of Metric System (Sept. 16, 1965, report from the Committee on Commerce, U. S. Senate, 89th Congress, 1st session, to accompany S. 774), 7 pp., printed. Committee reported bill favorably with amendments. Presents purpose, background, provisions, cost, agency comments, and changes in existing law.

Senate Sept. 20, 1965, passed with amendment and cleared for House S. 744. Purpose of the bill is to authorize the Secretary of Commerce to make a 3-year study to determine the advantages and disadvantages of increased use of the metric system of weights and measures in the United States. A complete report to the Congress of the findings, together with appropriate recommendations, is required under the bill. Not to exceed \$500,000 for the first year is authorized for the study.

House Sept. 21, 1965, received a message that the Senate had passed S. 774, and that concurrence of the House was requested.

MINIMUM WAGE: Amendments to the Fair Labor Standards Act: Hearings before the Subcommittee on Labor of the Committee on Labor and Public Welfare, United States Senate, 89th Congress, 1st session, on S. 763, S. 1741, S. 1770, S. 1986, and S. 2210, bills amending the Fair Labor Standards Act of 1938, as amended, Part 1 and Part 2, July 6, 7, 8, 9, 12, 13, 14, 15, and 16, 1965, 1,422 pp., printed. Contains text of the bills, list of witnesses, statements and letters from various Federal officials, Members of Congress, representatives of various business firms, associations, etc.

H. Rept. 871, Fair Labor Standards Amendments of 1965 (Aug. 25, 1965, report from the Committee on Education and Labor, U. S. House of Representatives, 89th Congress, 1st session, to accompany H. R. 10518), 87 pp., printed. Committee reported bill favorably without amendment. Contains introductory statement, finding and declaration of policy, subcommittee hearings, history of act, summary of provisions, comments on major provisions, section-by-section analysis, minority views, scope of bill, and views of various Congressmen.

OCEANOGRAPHIC AGENCY OR COUNCIL: National Oceanographic Program Legislation: Hearings before the Subcommittee on Oceanography of the Committee on Merchant Marine and Fisheries, House of Representatives, 89th Congress, 1st session, on H. R. 921, H. R. 2218, H. R. 3310, H. R. 3352, H. R. 5175, H. R. 5654, H. R. 5884, H. R. 6009, H. R. 6457, H. R. 6512, H. R. 7301, H. R. 7798, H. R. 7849, H. R. 9064, H. R. 9483, H. R. 9617, H. R. 9667, H. R. 10432, and S. 944, Aug. 3, 4, 5, 10, 11, 12, 13, 17, 18, and 19, 1965, Serial No. 89-13, 648 pp., printed. Contains texts of the bills, agency reports, statements from various Federal and State officials, Congressmen, and others.

House Committee on Merchant Marine and Fisheries Sept. 16, 1965, reported favorably to House S. 944 (amended), to provide for expanded research and development in the marine environment of the U. S., to establish a National Council on Marine Resources and



Engineering Development, and a Commission on Marine Science, Engineering and Resources.

Committee Sept. 17, 1965, reported (H. Rept. 1025) bill to House, with amendment; to Committee of the Whole House on the State of the Union.

House Sept. 20, 1965, amended and passed S. 944. House-passed bill was returned to the Senate. Title was amended: "To provide for a comprehensive, long-range, and coordinated national program in marine science, to establish a Commission on Marine Science, Engineering, and Resources, and for other purposes." (1) It is cited as the "Marine Resources and Development Act of 1965." (2) Makes a clear declaration of national policy. (3) Sets forth some eight objectives to which the marine science activities should contribute. (4) Prescribes the duties and responsibilities of the President for the development, maintenance, and administration of marine science activities in the United States. (5) Would direct the President to establish a self-liquidating Commission on Marine Science, Engineering, and Resources to "make a comprehensive investigation and study of all aspects of marine science in order to recommend an overall plan for an adequate national oceanographic program that will meet the present and future national needs." The Commission is to make its final report within 18 months after its establishment. (6) Would require the President to submit annual reports to the Congress in connection with the Federal Government's activities in marine sciences, including recommendations for legislation and estimates of costs. (7) Would broadly define the terms "marine science" and "marine environment." (8) Would authorize the appropriation of such sums as may be necessary but provide a limitation of not to exceed \$1.5 million per year. (9) Oceans and Great Lakes would be included in the program. Such funds would be used to strengthen the staffing of the Interagency Committee on Oceanography as well as finance the activities of the Commission. As passed by the House the bill contains most of the Senate version. The principal differences are that the House committee amendment does not authorize the establishment of a statutory Cabinet-level-Council--with assignment of responsibilities at the discretion of the President. It places those responsibilities directly on the President. Other major differences between the two versions is that the appointment of the Commission is entirely discretionary under the Senate bill, while it is mandatory under the House version.

H. R. 11159 (Wydlar) introduced in House Sept. 20, 1965, to provide for a comprehensive, long-range, and coordinated national program in oceanography, and for other purposes; to Committee on Merchant Marine and Fisheries.

The Senate Sept. 21, 1965, received a message that the House had passed S. 944 and requested the concurrence of the Senate.

Rep. Keith in extension of remarks in Congressional Record, Sept. 24, 1965 (pp. A5428-A5429) inserted this editorial which appeared in the Sept. 24 edition of the Washington Post: "To Study Marine Science." The editorial praises the legislative efforts in behalf of the ocean sciences and suggests that the conferees adopt the amendments passed by the House.

Rep. Matsunaga in extension of remarks in Congressional Record, Oct. 1, 1965 (pp. A5546-A5547)

pointed out that speed must necessarily characterize the implementation of S. 944, and that we must make immediate use of all of our existing resources. He also inserted in the Record the article, "A Billion A Year In Oceanics," from the Sept. 18, 1965, issue of the Honolulu Star-Bulletin. Article discusses potentialities that Hawaii has to offer in our national marine resources development effort.

ORDERLY MARKETING: H. R. 11454 (Flood) introduced in House Oct. 6, 1965, to provide for the orderly marketing of articles imported into the United States, to establish a flexible basis for the adjustment by the U. S. economy to expanded trade, and to afford foreign supplying nations a fair share of the growth or change in the U. S. market; to the Committee on Ways and Means.

PESTICIDES AND FISH AND WILDLIFE: House Committee on Merchant Marine and Fisheries, Sept. 14, 1965, reported (H. Rept. 1002) on S. 1623, to amend the act of Aug. 1, 1958, relating to a continuing study by the Secretary of the Interior of the effects of insecticides, herbicides, fungicides, and other pesticides upon fish and wildlife for the purpose of preventing losses to this resource, without amendment; to Committee of the Whole House on the State of the Union.

H. Rept. 1002, Protection of Fish and Wildlife from Pesticides (Sept. 14, 1965, report of the Committee on Merchant Marine and Fisheries, U. S. House of Representatives, 89th Congress, 1st session, to accompany S. 1623), 7 pp., printed. Committee reported bill favorably without amendment. Discusses purpose, background, need for legislation, cost, and changes in existing law.

House Sept. 20, 1965, passed S. 1623. This cleared the bill for the President. Would impose a 3-year limitation on what otherwise was a program that was open-ended insofar as time is concerned; raise the money authorized for research into the effects of pesticides on fish and wildlife from \$2,565,000 to \$3,200,000 for the first year, and then to \$5 million for each of the next 2 years.

The President Oct. 1, 1965, signed S. 1623 (P. L. 89-232).

STATE DEPARTMENT APPROPRIATIONS FY 1966: Departments of State, Justice, and Commerce, the Judiciary, and related Agencies Appropriations, 1966: Hearings before the Subcommittee of the Committee on Appropriations, United States Senate, 89th Congress, 1st session, on H. R. 8639, making appropriations for the Departments of State, Justice, and Commerce, the Judiciary, and related Agencies for the Fiscal Year ending June 30, 1966, 1,004 pp., printed. Contains testimony and statements from various Federal officials and members of Congress. Included under the State Department are funds for the various International Fisheries Commissions.

H. Rept. 807, Departments of State, Justice, and Commerce, the Judiciary, and related agencies appropriation bill, 1966 (Aug. 18, 1965, report from the Committee of Conference, U. S. House of Representatives, 89th Congress, 1st session, to accompany H. R. 8639), 5 pp., printed. Committee reported favorably with various amendments. Contains statement of the managers on the part of the House.

**STERN RAMP TRAWLERS:** H. R. 11185 (Bates) introduced in House Sept. 21, 1965, to authorize the Secretary of the Interior to construct two modern stern-ramp trawlers to be used for experimental, commercial fishing, research, and for other purposes; to Committee on Merchant Marine and Fisheries.

S. 2589 (Magnuson and 3 others) introduced in Senate Oct. 1, 1965, to authorize the Secretary of the Interior to construct two modern stern-ramp trawlers to be used for experimental, commercial fishing, research, and for other purposes; to the Committee on Commerce. Sen. Magnuson in Congressional Record, Oct. 1, 1965 (pp. 24902-24903) pointed out that this proposed legislation will authorize the Secretary of the Interior to build two factory-processing trawlers for experimental harvesting and processing of fishery resources. Under the bill, the Secretary is authorized to operate the vessels or he may charter the vessels to private operators. Conditions have been placed in the legislation which will assure that the operation of the vessels will not have an adverse effect upon domestic fishery prices or current market demand.

**TECHNOLOGICAL LABORATORY LAND IN MARYLAND:** Subcommittee on Mines and Mining of House Committee on Interior and Insular Affairs Sept. 14, 1965, approved for full committee action H. R. 9334 (amended), to provide for the conveyance of certain real property of the United States to the State of Maryland. Property affected includes the site of the Bureau of Commercial Fisheries Technological Laboratory, College Park, Maryland. Full Committee Sept. 15 ordered bill reported favorably; Sept. 16 reported (H. Rept. 1013) bill to House.

H. Rept. 1013, Providing for the Conveyance of Certain Real Property of the United States to the State of Maryland (Sept. 16, 1965, report from the Committee of the Whole House on the State of the Union, to accompany H. R. 9334), 4 pp., printed. Committee reported bill favorably with amendments. Discusses purpose, need, cost, departmental recommendations, and committee recommendation.

House Sept. 20, 1965, passed H. R. 9334. House then considered and passed a similar Senate-passed bill, S. 1988. Proceedings for passage of H. R. 9334 were vacated and bill was laid on the table. This action cleared S. 1988 for the President.

The President Oct. 1, 1965, signed S. 1988 (P. L. 89-227).

**VESSEL MEASUREMENT:** S. Rept. 677, Admeasurement of Small Vessels, September 2 (legislative

day, September 1), 1965, report from the Committee on Commerce, U. S. Senate, 89th Congress, 1st session, to accompany S. 2142), 8 pp., printed. Committee reported favorably with amendments. Presents the purpose, legislative background, a general statement, an analysis, changes in existing law, and agency reports.

**WATER POLLUTION CONTROL ADMINISTRATION:** Conferees, Sept. 14, 1965, in executive session, agreed to file a conference report on the differences between the Senate- and House-passed versions of S. 4, to amend the Federal Water Pollution Control Act, as amended, to establish the Federal Water Pollution Control Administration, to provide grants for construction of municipal sewage treatment works, to authorize the establishment of standards of water quality to aid in preventing, controlling, and abating pollution of interstate waters, and for other purposes. Committee of Conference Sept. 17 reported (H. Rept. 1022) bill out.

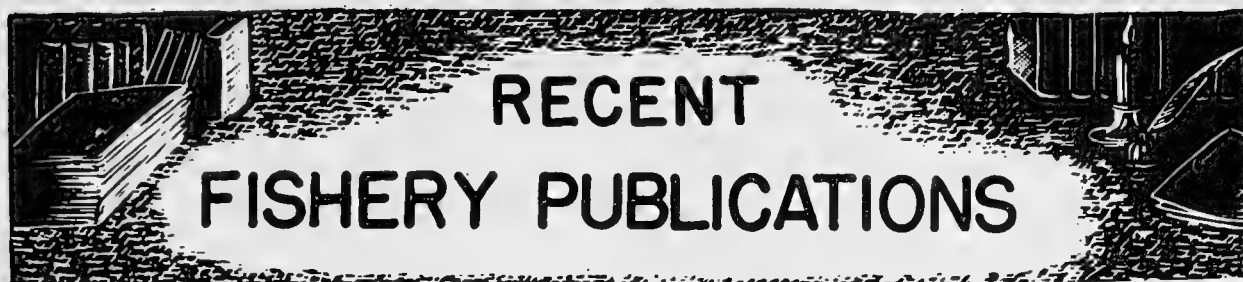
H. Rept. 1022, Water Quality Act of 1965 (Sept. 17, 1965, report from the Committee of Conference, House of Representatives, 89th Congress, 1st session, to accompany S. 4), 14 pp., printed. Committee recommended that Senate recede from its disagreement to the amendment of the House to the text of the bill and agree to same with amendment. Includes statement of managers on the part of the House.

House Sept. 21, 1965, adopted the conference report on S. 4, the Water Quality Act of 1965, and sent the bill to the Senate. The Senate also adopted the conference report, thus clearing the bill for the President's signature. Makes several important changes in the Federal water pollution control program. Provides for an additional Assistant Secretary of HEW and an administrator to guide the program, which is removed from the Public Health Service; adoption of water quality criteria applicable to interstate waters; standards of water quality to be such as to protect the public health or welfare and enhance water quality; establishing a policy and purpose for the Act; a four-year, \$80 million program for demonstration grants on controlling pollution from sewers; increased Federal grants to municipalities for building waste treatment plants.

The President Oct. 2, 1965, signed S. 4 (P. L. 89-234). Sen. Boggs inserted in Congressional Record, Oct. 4, 1965 (pp. 24998-24999) the article "The Economics Of A New Pollution Control Policy" by Gershon Fishbein, from the Oct. 3, 1965, issue of the Washington Star.

**WHALING:** Sen Bartlett inserted in Congressional Record, Sept. 30, 1965 (pp. 24658-24661), an article by Noel Simon, entitled "Of Whales and Whaling," from the August 27, 1965, issue of Science.





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CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.  
FL - FISHERY LEAFLETS.  
MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.  
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.  
SL - STATISTICAL LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.  
SSR. - FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

Number	Title
CFS-3848	- Frozen Fishery Products, June 1965, 8 pp.
CFS-3855	- Michigan, Ohio & Wisconsin Landings, March 1965, 4 pp.
CFS-3865	- New Jersey Landings, May 1965, 3 pp.
CFS-3867	- Fish Sticks, Fish Portions, and Breaded Shrimp, April-June 1965, 3 pp.
CFS-3869	- Maryland Landings, April 1965, 4 pp.
CFS-3873	- Fish Meal and Oil, June 1965, 2 pp.
CFS-3878	- Rhode Island Landings, March 1965, 3 pp.
CFS-3879	- Massachusetts Landings, January 1965, 5 pp.
CFS-3881	- Louisiana Landings, May 1965, 3 pp.
CFS-3885	- Florida Landings, June 1965, 8 pp.

SL-10 - Wholesale Dealers in Fishery Products, Maryland, 1964 (Revised), 9 pp.

### Firms Canning Fishery Products, 1964 (Revised):

SL-102A - Pacific Sardines, 1 p.  
SL-103 - Tuna, 2 pp.  
SL-103A - Tunalike Fishes, 1 p.  
SL-104 - Mackerel, 1 p.  
SL-105 - Alewives, 1 p.  
SL-106 - Shad, 1 p.  
SL-110 - Oysters, 2 pp.  
SL-118 - Groundfish Flakes, 1 p.  
SL-119 - Squid, 1 p.  
SL-120 - Anchovies, 1 p.

Sep. No. 742 - Pasteurization of Fishery Products with Gamma Rays from a Cobalt-60 Source.

Sep. No. 743 - Construction and Operation of the "Cobb" Pelagic Trawl (1964).

FL-578 - Haddock, by Albert C. Jensen, 7 pp., illus., June 1965. Covers the occurrence and commercial value of the haddock (*Melanogrammus aeglefinus*), and its spawning and early life, growth, age deter-

mination, commercial otter-trawl fishery, market utilization, and biological research.

SSR-Fish. No. 509 - Laboratory Evaluation of the 1-on-10 Slope Ice Harbor Fishway Design, by Clark S. Thompson and Joseph R. Gauley, 23 pp., illus., June 1965.

SSR-Fish. No. 511 - Evaluation of Biological Stains, Inks, and Fluorescent Pigments as Marks for Shrimp, by Edward F. Klima, 8 pp., illus., May 1965.

SSR-Fish. No. 512 - Hypotheses on the Origin of Exploited Skipjack Tuna (*Katsuwonus pelamis*) in the Eastern and Central Pacific Ocean, by Brian J. Rothschild, 20 pp., illus., April 1965.

SSR-Fish. No. 519 - Biological Investigations of Purse Seine Fishery for Atlantic Menhaden, by Kenneth A. Henry, 15 pp., illus., July 1965. After record catches in 1961 and 1962 of about 2.3 billion pounds of menhaden (*Brevoortia* species), the United States catch declined to about 1.5 billion pounds in 1964. Most of the decrease was in the North and Middle Atlantic areas. This report reviews biological research on the menhaden and discusses landings by area, fishing intensity by area, drop in catch per standard vessel day and total catch, shift of fishing effort to different areas, average age of catch, and estimates of abundance.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BUREAU OF COMMERCIAL FISHERIES, RM 510, 1815 N. FORT MYER DR., ARLINGTON, VA. 22209.

Number	Title
MNL-23	- (Supplement) Fisheries of Chile, 1964, 19 pp.
MNL-58	- Republic of Korea's Fishing Industry, 1964, 14 pp.
MNL-92	- (Supplement) Danish Salmon Fisheries in Greenland, 1964, 5 pp.

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE ONLY FROM THE ICHTHYOLOGICAL LABORATORY, BUREAU OF COMMERCIAL FISHERIES, U. S. NATIONAL MUSEUM, WASHINGTON, D. C. 20560.

Preliminary Data on the Work with the Mid-Water Depressor Trawl in the Waters of the Southern Hemisphere, by A. P. Andriashev and U. E. Permitin, 2 pp., Translation No. 35, processed. (Translated from the Russian, Bulletin Soviet Antarctic Expedition, no. 3, 1958, pp. 69-70.)

The Systematic Position of the Black Sea Mackerel (TRACHURUS), by Yu. G. Aleev, Translation No. 34, 15 pp., processed. (Translated from the Russian, Voprosy Ikhtiologii, no. 7, 1956, pp. 174-184.)

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, July 1965, 15 pp., (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif. 90731.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; prices for fish meal, oil, and solubles; for the month indicated.

California Fishery Market News Monthly Summary, Part II - Fishing Information, July 1965, 12 pp., illus. (U. S. Bureau of Commercial Fisheries, Tuna Resources Laboratory, P. O. Box 271, La Jolla, Calif. 92038.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the month indicated.

New England Fisheries--Monthly Summary, June 1965, 22 pp., (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston, Mass. 02210.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, and Provincetown), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the month indicated.

New York City's Wholesale Fishery Trade--Monthly Summary--July 1965, 16 pp. (Market News Service, U. S. Fish and Wildlife Service, 346 Broadway, New York, N. Y. 10013.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the month indicated.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. 20402

Fishery Statistics of the United States, 1963, by Charles H. Lyles, Statistical Digest 57, 524 pp., illus., processed, 1965, \$2.25. As in previous years, this edition of the Statistical Digest contains a review of the overall United States fishing industry; and sections on the fisheries of New England, the Middle Atlantic, Chesapeake, South Atlantic, Gulf, Pacific Coast, Great Lakes, Mississippi River, and Hawaii. This edition also contains a section on the Puerto Rican fisheries. As usual, it gives a statistical review of the fisheries for cod, haddock, halibut, salmon, sardines, mackerel, tuna, menhaden, crab, oyster, shrimp, and other trawl-caught species. In conclusion, it presents historical fishery statistics, 1873-1963; the statistical procedures used in preparing

the Digest; a pictorial section showing many species of finfish and shellfish; and a list of statistical publications issued by the U. S. Bureau of Commercial Fisheries for 1963. Analysis of the data presented shows that in 1963 the commercial fisheries of the United States yielded a catch of 4.8 billion pounds worth \$377 million to the fishermen. The quantity was 507 million pounds and \$19 million less than in 1962. The average value was 7.78 cents a pound; record landings of flounder, clams, and crabs were made. The total catch was made by 128,470 fishermen operating 11,928 vessels of 5 net tons and over and 66,045 smaller craft.

Guide for Buying Fresh and Frozen Fish and Shellfish, Circular 214, 50 pp., printed, 1965, 25 cents. This pamphlet offers information to help consumers, food buyers, and others associated with the food trades to know more about fish and shellfish. It is a guide to when and where fishery products are available, and describes general market forms, types of containers used, purchasing criteria, and handling and storage techniques for finfish and shellfish.

Articles from Progressive Fish-Culturist, single copy 25 cents:

"Dry concentrates as complete trout foods for growth and egg production," by Arthur M. Phillips and others, vol. 26, no. 4, 1964, pp. 155-159.

"A method of immobilizing fish for collection of blood or for inoculation," by George Post, vol. 27, no. 1, 1965, p. 48, illus.

"Observations on 'bad eggs' in Columbia River fall chinook salmon," by John F. Conrad, vol. 27, no. 1, 1965, pp. 42-44.

"An underwater camera housing for shallow-water ecological studies," by John J. Poluhovich, vol. 26, no. 4, 1964, pp. 191-193.

"Research on bacterial fish diseases in the Institute of Marine Biology (Argentina)," by David A. Conroy, vol. 27, no. 2, 1965, p. 100.

## MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

### ACCLIMATIZATION:

"O teorii akklimatizatsii vodnykh zhivotnykh" (Theory of the acclimatization of aquatic animals), by G. L. Shkorbatov, article, *Zoologicheskii Zhurnal*, vol. 43, no. 7, 1964, pp. 953-964, illus., printed in Russian with English summary, Redaktsiia Zoologicheskogo Zhurnala, Podmosenskii per. d.21, Moscow B-64, U.S.S.R.

### ALGAE:

Articles from *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 30. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan:

"Comparative biochemistry of carotenoids in algae. I--On carotenoids in *Porphyra tenera* K.," by Teruhisa Katayama, May 1964, pp. 436-439.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

"Fundamental studies on the production of alginic acid. I--Investigation of determination method of alginic acid in brown algae," by Yuzo Harada, Feb. 1964, pp. 141-146.

#### ANCHOVY:

"Nekotorye zakonomernosti kolebanii chislennosti i eliminatsii ikrinok i lichinok *Engraulis encrasicolus* ponticus Alex. v usloviyakh Chernogo morya" (Patterns of variation in abundance and mortality of *Engraulis encrasicolus* ponticus Alex. eggs and larvae in the Black Sea), by T. V. Dekhnik, article, Trudy Sevastopol'skoi Biol. Sta. Akad. Nauk Ukr. SSR., vol. 16, 1963, pp. 340-358, printed in Russian. Four Continent Book Corp., 156 5th Ave., New York, N. Y. 10010.

#### BERING SEA:

"Nekotorye nauchnye predposylki dlya organizatsii beringovomorskoj nauchno-promyslovoi ekspeditsii" (Some scientific prerequisites for organizing a Bering Sea scientific fishery expedition), by P. A. Moiseev, article, Tr. Vses. Nauch. Issled. Inst. Morskogo Rybn. Khoz. Okeanogr., vol. 48, 1963, pp. 7-12, printed in Russian. Trudy Vsesoyuznogo Nauchno-Issledovatel'skogo Instituta Morskogo Rybnogo Khoziaistva i Okeanografii, Verkh. Krasnosel'skaia No. 17, Moscow B-140, U.S.S.R.

#### BIOCHEMISTRY:

"Biochemical changes in catfish, tilapia, and mrigal fish during rigor mortis," by S. S. Pawar and N. G. Magar, article, Journal of Food Science, vol. 30, Jan.-Feb. 1965, pp. 121-125, printed. Institute of Food Technologists, 510-522 N. Hickory St., Cham-paign, Ill. 61823.

#### CALIFORNIA:

California Fish and Game, vol. 51, no. 3, July 1965, 96 pp., illus., printed, single copy \$0.75. Office of Procurement, Documents Section, P. O. Box 1612, Sacramento, Calif. 95807. Some of the articles are: "Food of the blue rockfish, *Sebastes mystinus*," by Daniel W. Gotshall, J. Gary Smith, and Allen Holbert; "Intraspecific eye lens protein differences in yellowfin tuna, *Thunnus albacares*," by Albert C. Smith; and "Pacific mackerel, the commercial fishery, and age composition of the Southern California catch for the 1961-62, 1962-63, and 1963-64 seasons," by J. D. Messersmith and Harold Hyatt.

Statistical Report of Fresh, Canned, Cured and Manufactured Fishery Products for 1964, by E. C. Greenwood, Circular No. 39, 16 pp., printed, 1965. Bio-statistical Section, Marine Resources Operations, Department of Fish and Game, Sacramento, Calif.

#### CANADA:

Annual Report, Department of Fisheries, 1963/64, 23 pp., printed, 1964. Department of Fisheries, Charlottetown, Prince Edward Island, Canada.

Annual Report, Department of Fisheries, 1963/64, 55 pp., printed, 1964. Department of Fisheries, Fredericton, New Brunswick, Canada.

Annual Report of the Fisheries Research Board of Canada, 1962/63, 140 pp., illus., printed, 1964. Fisheries Research Board of Canada, Ottawa, Canada.

"A Checklist of Canadian Atlantic Fishes with Keys for Identification," by W. B. Scott and M. G. Scott, Contribution no. 66 of Life Sciences, 106 pp., illus., printed, 1965. Royal Ontario Museum, University of Toronto, Toronto, Canada.

Available from Queen's Printer and Controller of Stationery, Ottawa, Canada:

Fisheries Statistics, Nova Scotia, 1963, Catalogue No. 24-205, 47 pp., illus., processed, July 1965, C\$0.75.

Journal of the Fisheries Research Board of Canada, vol. 21, no. 6, December 1964, 202 pp., illus., printed, single copy C\$2.25. Some of the articles are: "Sterol metabolism in the oyster (*Crassostrea virginica*)," by T. Tamura; "The application of gas chromatography to the identification of the sterols of scallop (*Placopecten magellanicus*)," by T. Wainai and others; and "Lobster (*Homarus americanus*) tolerance for tris buffer, sodium fluoride, and sea water extracts of various woods," by James E. Stewart and John W. Cornick.

Journal of the Fisheries Research Board of Canada, vol. 22, no. 3, May 1965, 232 pp., illus., printed, single copy C\$2.25. Among the articles are: "Lysocithinase of cod muscle," by M. Yurkowski and H. Brockerhoff; "Chalkiness in halibut in relation to muscle pH and protein denaturation," by N. Tomlinson, S. E. Geiger, and E. Dollinger; "Factors affecting stream location, and timing and intensity of entry by spawning kokanee (*Oncorhynchus nerka*) into an inlet of Nicola Lake, British Columbia," by H. W. Lorz and T. G. Northcote; "First transponding oceanographic buoys in the Pacific," by F. Favorite, D. Fisk, and W. J. Ingraham, Jr.; "Browning of freeze-dried fish," by H. L. A. Tarr and R. E. A. Gadd; "Zone electrophoretic comparison of muscle myoglobins and blood proteins of artificial hybrids of Salmonidae with their parental species," by H. Tsuyuki and Eve Roberts; "Post-spawning death of Pacific salmon: sockeye salmon (*Oncorhynchus nerka*) maturing and spawning in captivity," "Studies on the quality of Newfoundland cod. 11--Thaw-drip in polyphosphate-treated and untreated fillets," by Dorothy A. Chalker, W. A. MacCallum, and D. R. Idler; "Orange-red meats in sea scallops," by Neil Bourne and E. G. Bligh; and "Haematological study of the hake (*Merluccius merluccius*) from the southwest Atlantic," by D. A. Conroy and J. L. Rodriguez.

#### CAPELIN:

"Nekotorye cherty ekologii moivy (*Mallotus villosus* villosus Muller) Barentseva morya" (Some features of the ecology of Barents Sea capelin), by V. S. Prokhorov, article, Trudy Polyarnogo Nauch.-Issled. Proekt. Inst. Morsk. Rybn. Khoz. Okeanogr., vol. 15, 1963, pp. 163-176, printed in Russian. Poliarnii Nauchno-Issledovatel'skii i Proiktnyi Institut Morskogo Rybnogo Khoziaistva i Okeanografii im. N. M. Knipovicha, Moscow, U.S.S.R.

#### CARP:

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Izvestiya Gosudarstvennogo Nauchno-Issledovatel'skogo Instituta Ozerogo i Rechnogo Rybnogo Khoziaistva, Leningrad, U.S.S.R.

#### CLAMS:

"Observations on the origin of the paralytic poison in Alaska butter clams," by Edward J. Schantz and Harris W. Magnusson, article, Journal of Protozoology, vol. 11, no. 2, 1964, pp. 239-242, printed. Society of Protozoologists, Rockefeller Institute, 66th St. and York Ave., New York, N. Y. 10021.

#### COD:

"Osobennosti migratsii Barentsevymorskoi nepolovozrelai treski pervogo polugoidya 1962 goda (po dannym mecheniya)" (Characteristics of the migration of Barents Sea immature cod during the first half of 1962--according to tagging data), by Yu. I. Spiridonov, article, Referativnyi Zhurnal-Biologiya, 1964, Abstract No. 17138, printed in Russian. Akademiia Nauk SSSR, Institut Nauchnoi-Informatsii, Moscow, U.S.S.R.

Articles from Trudy Polyarnogo Nauch.-Issled. Proekt. Inst. Morsk. Rybn. Khoz. Okeanogr., vol. 15, 1963, printed in Russian. Poliarnii Nauchno-Issledovatel'skii i Proiktnyi Institut Morskogo Rybnogo Khoziaistva i Okeanografii im. N. M. Knipovicha, Moscow, U.S.S.R.:

"Ossene-zimne raspredelenie prednerestovyykh i nerestovyykh skoplenii saiki (*Boreogadus saida* Lepechin) v Barentsvom more" (Fall-winter distribution of prespawning and spawning aggregations of arctic cod in the Barents Sea), by V. P. Ponomarenko, pp. 177-197.

"Treska Murmanskogo poberezh'ya" (Cod of the Murman coast), by T. I. Glebov, pp. 69-130.

#### CRUSTACEA:

Pacific Crustacea, by Spencer Wilkie Tinker, 134 pp., illus., printed. Charles E. Tuttle Co., Rutland, Vermont. An illustrated popular-type handbook on the reef-dwelling crustacea of Hawaii and the South Seas.

#### DANISH SEINE:

"Frequency of hauls by Danish seiners in Bristol Bay with respect to catch in tons," by Hiroshi Maeda and Shiro Minami, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 30, July 1964, pp. 554-559, printed. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

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"Composition of the diacyl glyceryl ethers and triglycerides of the flesh and liver of dogfish (*Squalus acanthias*)," by Donald C. Malins, John C. Wekell, and Clifford R. Houle, article, Journal of Lipid Research, vol. 6, Jan. 1965, pp. 100-105, printed. University Publishers, Inc., 59 E. 54th St., New York, N. Y. 10022.

#### ECHO-SOUNDER:

"O registratsii ekholotom razrezhennoi ryby u dna" (Detection of dispersed fish near the sea-bottom by means of echo-sounders), by K. I. Yudanov, article, Trudy Nauchn.-Issled. Inst. Rybn. Khoz. Latviisk.

SSR, vol. 3, 1961, pp. 175-183, printed in Russian. Four Continent Book Corp., 156 Fifth Ave., New York, N. Y. 10010.

"On the use of the echo sounder in lake investigations," by Roland Schroeder and Hanne Schroeder, article, Memorie, Istituto Italiano di Idrobiologia Dott. Marco Marchi, vol. 17, 1964, pp. 167-188, illus., printed. Istituto Italiano di Idrobiologia, Milan, Italy.

#### ELECTRICAL FISHING:

"Electrical shrimp trawl is nearing commercial stage," by Aline Miller, article, National/Maine Coast Fisherman, vol. 46, no. 5, Aug. 1965, pp. 10-11, illus., printed, single copy 25 cents. Journal Publishing Co., 66 High St., Belfast, Me.

#### FISH BEHAVIOR:

"Izuchenie reaktivnoi rybn. na setnoe polotno" (A study of the reaction of fish to net webbing), by N. E. Aslanova, article, Trudy Vses. Nauchn.-Issled. Inst. Morsk. Rybn. Khoz. i Okeanogr., vol. 44, 1961, pp. 165-176, printed in Russian. Trudy Vsesoiuznyi Nauchno-Issledovatel'skii Institut Morskogo Rybnogo Khoziaistva i Okeanografii, Verkh. Krasnosel'skaia No. 17, Moscow B-140, U.S.S.R.

"Some experiments in marine biotelemetry," by H. A. Baldwin, article, Naval Research Reviews, vol. 18, no. 2, Feb. 1965, pp. 15-20, illus., printed, single copy \$0.15. Office of Naval Research, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) The dolphin, an air-breathing marine mammal, is an excellent subject for specialized investigations of physiological responses which occur in mammals, including man, in the marine environment. However, the techniques and equipment necessary for measuring these responses, particularly at considerable ocean depths and pressures, are not now available. Thus the author is trying to devise telemetering devices which convey physiological information from the subjects to observers at the surface. Some of his studies are described in this article.

#### FISH CULTURE:

"Teoreticheskie i prakticheskie osnovy primeneniya iskusstvennogo ryborazvedeniya" (Theoretical and practical bases for artificial fish culture), by N. I. Kozhin, article, Voprosy Ikhtiologii, vol. 4, no. 1, 1964, pp. 92-96, printed in Russian. Akademiia Nauk SSSR, Ikhtiologicheskaya Komissiya, Moscow, U.S.S.R.

Articles from Izvestia Gos. Nauch.-Issled. Inst. Ozer. Rechn. Rybn. Khoz., vol. 55, 1963, printed in Russian with English summary. Four Continent Book Corp., 156 Fifth Ave., New York, N. Y. 10010:

"Khimicheskii metod rybokhoziaistvennogo preobrazovaniya ozer--predvaritel'nye rezul'taty i perspektivy" (A chemical method for rendering lakes suitable for fish culture--preliminary results and perspectives), by E. V. Burmakina, pp. 7-17.

"Perspektivy rybokhoziaistvennogo ispol'zovaniya mal'nykh ozer, podgotovlennykh khimicheskimi metodami" (Prospects in utilization of small chemically-treated lakes for fisheries or fish culture), by B. I. Ponedelko, pp. 127-134.



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Articles from Trudy Vses. Nauch.-Issled. Inst. Prudovogo Rybn. Khoz., vol. 12, 1963, printed in Russian. Four Continent Book Corp., 156 Fifth Ave., New York, N. Y. 10010:

"Vyrashchivanie ryboposadochnogo materiala na vyrabotannykh frezernykh polyakh s primeneniem agromeliorativnykh i intensivifikatsionnykh meropriyatiy" (The culture of fish for stocking in fertilized and harrowed ponds), by E. N. Khairulina, pp. 25-34.

"Vyrashchivanie tovarnoi ryby na kar'erakh gidrotorfa i vyrabotannykh frezernykh polyakh s primeneniem kompleksa intensivifikatsionnykh meropriyatiy" (Raising fish of commercial size in harrowed and fertilized ponds), by A. G. Mints, pp. 35-46.

#### FISHERY RESOURCES:

"The potential harvest of the sea," by Milner B. Schaefer, article, *Transactions of the American Fisheries Society*, vol. 94, no. 2, 1965, pp. 123-128, illus., printed. American Fisheries Society, 1404 New York Ave. NW., Washington, D. C. 20005.

#### FISH FILLETS:

"Skinning fish fillets," article, *Food Manufacture*, vol. 39, May 1964, p. 81, printed. Grampian Press, Ltd., The Tower, Shepherds Bush Rd., Hammer-smith, London W6, England.

#### FISH FLAKES:

"A nutritional evaluation of fish-potato flakes," by M. A. Krishnaswamy and others, article, *Food Technology*, vol. 19, 1965, p. 629, printed, single copy \$1.50. The Garrard Press, 510 N. Hickory St., Champaign, Ill. 61823.

#### FISH HATCHERIES:

*Investigation and Development of Fish Hatcheries*, by Robert A. Weir, Fish and Wildlife Series no. 11, 28 pp., processed, 1964. Department of Lands and Forests, Toronto, Ontario, Canada.

#### FISH-LIVER OIL:

"Changes in the fatty acid composition of cod-liver oil caused by radiation," by A. A. Fomin, article, *Chemical Abstracts*, vol. 61, July 6, 1964, p. 845g, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

"CIS-11-docosenoic acid in cod liver oil," by Mary J. Chisholm and C. Y. Hopkins, article, *Canadian Journal of Biochemistry*, vol. 43, Jan. 1965, pp. 130-132, printed. National Research Council, Ottawa, Canada.

#### FISH MEAL:

*Favourable Effect of Antioxidants on Metabolizable Energy and Protein Value of British Columbia Herring Meal*, by B. E. March and others, Circular No. 34, 5 pp., printed, 1965. Fisheries Research Board of Canada, Sir Charles Tupper Bldg., Riverside Dr., Ottawa, Canada.

"Feeding experiments with meal produced from herring preserved with sodium nitrite and formalin—possible connection between nitrite preservation and toxic hepatitis in sheep," by N. Koppang and others, article, *Nord. Vet.-Med.*, vol. 16, 1964, pp. 343-362,

printed in Norwegian. Veterinary College of Norway, Oslo, Norway.

"Fish meal as insurance for poultry and swine," by C. F. Winchester, article, *Feed Age*, vol. 15, no. 1, p. 35, printed. American Trade Publishing Co., 71 Vanderbilt Ave., New York, N. Y. 10017.

"The influence on chick growth of fishmeals differing in form of raw material, species of fish, and processing," by H. Vogt, article, *Archiv für Geflügelkunde*, vol. 29, no. 1, 1965, p. 72, printed in German. Fritz Pfenningstorff, Herworthstr. 3, Berlin-Lichterfelde-1, German Federal Republic.

"Isolation and identification of a hepatotoxic factor in herring meal produced from sodium nitrite preserved herring," article, *Die Naturwissenschaften*, vol. 24, 1964, p. 637, printed in German. Springer-Verlag, Reichlietschauer 20, Berlin W35, Federal Republic of Germany.

"Quality of fish meal as a food," by K. Miwa, article, *Hokusuishi Geppo* (Journal of the Hokkaido Fisheries Research Scientific Institution), vol. 21, 1964, p. 226, printed in Japanese. Hokkaido-Ritsui Suisan Shikenjo, Hamanuka-Machi, Yoichi-Machi, Hokkaido, Japan.

"Studies on the incidence of Salmonellae in imported fishmeal," by J. Jacobs and others, article, *Tijdschrift voor Diergeneeskunde*, vol. 88, no. 22, 1963, 6 pp., printed in Dutch. Dr. W. A. DeHaan, Rubenslaan 123, Utrecht, Netherlands.

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History Under the Sea (A Handbook for Underwater Exploration), by Mendel Peterson, Smithsonian Publication 4538, 233 pp., illus., printed, 1965, \$3.00. Smithsonian Institution, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) A work unique in its field, this volume provides a reference to which a serious underwater historian or archaeologist may turn for instruction on exploration, recovery, and preservation techniques, and for the identification of artifacts. Included are chapters on locations of underwater sites, some expeditions in the Western Hemisphere, search techniques, condition of underwater sites, surveying those sites, and recovery techniques. Preservation of materials (metallic, ceramic, glass, animal, and vegetable) recovered from water, and identification of shipwrecks are discussed in considerable detail in the final chapters. The book also contains a bibliography and lists of marine museums and archives. Photos and drawings supplement the text, adding interest and excitement for historians and laymen alike. For people in fisheries occupations the book will be a spellbinder, for it opens up new vistas in the oceans' depths.

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Employment of Polychloropine for Altering Content of Fishes in Small Lakes of Belorussian SSR, USSR, by P. S. Nevyadomskaya, 6 pp., processed, May 17, 1965, \$1. (Translated from the Russian, Vestsi Akademii Navuk Beloruskay SSR, Seryya Biyalagichnykh Navuk, no. 1, 1965.) Clearinghouse for Federal Scientific and Technical Information, U. S. Department of Commerce, Port Royal and Braddock Rds., Springfield, Va. 22151.

#### PORTUGAL:

"Relatorio do Gremio dos Industriais de Conservas de Peixe do Norte" (Report of the Society of Northern Fish Cannery, 1964), article, Conservas de Peixe, vol. 20, no. 231, June 1965, pp. 17-19, 21, 23-24, 34, printed in Portuguese. Sociedade da Revista Conservas de Peixe, Lda., Regueirão dos Anjos, 68, Lisbon, Portugal.

#### PRESERVATION:

Fish Handling and Preservation (Proceedings at Meeting on Fish Technology, Scheveningen, September 1964), 332 pp., illus., processed, 1965, US\$5, or 30s., F 20, Sw. fr. 20, DM 16.50. Organisation for Economic Co-operation and Development, Paris, France. (For sale by McGraw-Hill Book Company, O.E.C.D.-Unit, TMIS Annex, 351 W. 41st St., New York, N. Y. 10036.) "The development of fishery technology not only enables the industry to face competition from other foodstuffs, which as a result of changed produc-

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tion and processing methods are enjoying a greater consumption, but also to take up a more important place in the household diet," states the introduction. The book itself contains lectures presented at the Scheveningen meeting, grouped by subjects: fish preservation at sea (with emphasis on quick-freezing); refrigerated sea water; fish handling (at sea and on shore); cold storage and thawing (with emphasis on thawing problems which are important to the quality of the end-product); port markets--quality and containers; packaging for retail; and distribution. Concluding remarks point out that "... in the national or international contact which has been established in the technological field between industry and research-workers, the problem of remunerative application deserves the greatest possible attention." An appendix lists the participants at the meeting. This is a comprehensive record of the meeting.

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#### PROTEIN:

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"Radionuclides in plankton and tuna from the Central Pacific," by F. G. Lowman, article, *Radioecology. Proceedings of the First National Symposium on Radioecology*, pp. 145-149, printed, 1963. Reinhold Publishing Corp., 430 Park Ave., New York, N. Y. 10022.

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Effects of Ionizing Radiation on Lipids of Fish, Final Report, Nov. 1963-Nov. 1964, by Maurice E. Stansby and George Kudo, TID-21405, 27 pp., printed, 1964, \$2. Clearinghouse for Federal Scientific and Technical Information, U. S. Department of Commerce, Port Royal and Braddock Rds., Springfield, Va. 22151.

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Canadian Border to Eureka, Calif., and Alaska, 1965.

Cape Hatteras, N. C., to Brunswick, Ga., 1965.

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"Deodorization of whale oil before its hydrogenation," by V. K. Losheschnik, vol. 62, Feb. 1, 1965, Abstract No. 2922d.

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#### WHITE SEA:

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622 pp., illus., printed, 1965, \$6. Columbia University Press, International Documents Service, 2960 Broadway, New York, N. Y. 10027. The sixth edition of this reference book for people who produce, market, and buy fish has recently been issued, with the importer and exporter sections expanded. Included are sections on foreign representatives, shipbuilders, suppliers of vessels, and processors in Belgium, Denmark, the Faroe Islands, Finland, France, Germany, Iceland, Ireland (a new addition), the Netherlands, Norway, Sweden, and the United Kingdom.

There is also a section containing lists of importers and exporters of fishery products in other European countries, Africa, Asia, Australia, New Zealand, the United States, Canada, and Central and South America. A separate part of the yearbook contains a register of fishing vessels in the selected European countries. Features of this edition are statistics on world landings of fish and shellfish, a list of fish terms in different languages, and an article detailing features of the United States-built stern trawler Narragansett.



### STUDY LAUNCHED OF ECONOMIC POTENTIALITIES OF CONTINENTAL SHELF

A study of the economic potentialities of the Continental Shelf, a vast 850,000 square miles of largely unexplored and unexploited territory belonging to the United States, has been launched by the U. S. Department of Commerce. The Department's Coast and Geodetic Survey announced June 13, 1965, that it awarded a contract to the Battelle Memorial Institute, Columbus, Ohio, to make "an economic study of the relationship of the scientific survey activities of this agency with respect to the Continental Shelf and their impact on the economic development of the United States." Estimated cost of the 14-week study is \$55,000.

The Coast and Geodetic Survey, as the Nation's chief civilian oceanographic agency, has been conducting, as part of its extensive work in oceanography, limited surveys of the Continental Shelf. The study will include an analysis of this work, of the capabilities of the Agency for enlarging its activities in this area, and of the potential benefits to the American economy if this is done.

Under an international agreement signed last year, the submerged extension of the continent off the Atlantic, Pacific, and Gulf coasts of the United States has been acquired by this country for economic exploitation, the most extensive territory to be added to the country since the Louisiana Purchase in 1803. The agreement provides that United States sovereignty covers "the seabed and subsoil of the submarine areas adjacent to the coast out to a depth of 200 meters," or 656 feet. The agreement further provides that sovereignty will also extend beyond that point to the extent that its natural resources can be exploited by this country.

The Continental Shelf extends from 10 to 300 miles off the American coast, including 175 miles off Cape Cod, from 50 to 125 miles off the South Atlantic states, from 50 to 150 miles into the Gulf of Mexico, from 10 to 50 miles off the Pacific Coast, and approximately 300 miles off the Alaskan coast. The Hawaiian Island's Shelf extends 10 to 50 miles offshore.

While the economic potentialities of the submerged offshore areas of the earth's continents are largely unknown, the exploitation of underwater resources is already under way in various parts of the world. Efforts to extract wealth from beneath the sea include extensive recovery of oil off the shores of the United States; diamond mining off the coast of southwest Africa; iron and coal mining off the Continental Shelf of Japan; tin off the Malaysian Shelf; and the extraction of magnesium and bromine from the sea at Freeport, Tex. Scientists say drilling in depths greater than 200 meters is already feasible.

## ANTIMICROBIAL SUBSTANCES IN CLAMS POSSESS TUMOR-PREVENTIVE ACTIVITY

Paolins, the antimicrobial substances known to be present in sea mollusks, have been found by latest experimental evidence to possess a tumor-preventive activity in addition to their antibacterial and antiviral effects, according to a report by scientists at the National Institutes of Health (NIH), Public Health Service, U. S. Department of Health, Education, and Welfare.

The discovery that extracts from the common clam prevent or delay virus-induced tumors in hamsters and also inhibit herpes simplex virus in tissue cultures, was reported December 11, 1965, by Dr. C. P. Li of the Division of Biologics Standards, NIH, at a meeting of the New York Academy of Sciences in New York City. This investigation was made by Dr. Li, Dr. Benjamin Prescott, Dr. Bernice Eddy, Dr. William Green, and G. Caldes, E. C. Martino, and A. M. Young.

They prepared the extract from fresh clams purchased in August and September 1964, since clams processed during the summer months have been reported to possess more inhibitory activity. The clams were shucked, homogenized, and mixed with an equal amount of ammonium sulphate solution. The supernatant was then dialyzed and dried, and the resulting tan-color, water-soluble powder was fractionated by column chromatography. Only the major fractions 1, 2, and 3 were used in the study.

Fractions 1 and 2 were administered to baby hamsters inoculated with adenovirus type 12. In one typical experiment, the hamsters were inoculated subcutaneously with the virus. Four days later, daily injections of the clam fractions were given to each infected hamster for two days. Infected, untreated hamsters served as controls. After 90 days, 8 of 11 controls developed tumors. Among two groups of infected hamsters that had been treated with the clam extracts, 3 of 10 and 5 of 10 developed tumors, with the average appearance of the tumors delayed for 13 days in comparison to the control animals.

Experiments for antiviral activity of the clam material against herpes simplex (cold sore) virus were made in primary rabbit kidney cells. The herpes simplex virus was inoculated into cultures immediately after the 3 clam extract fractions were added. After 3 days of incubation, the cytopathic effect in the treated tubes was found to be considerably suppressed with the virus titer reduced by 90 percent as compared to the control tubes.

In discussing the study, Dr. Li pointed out that the antiviral substances isolated from shellfish material probably belong to or are derived from the glyco- or mucoproteins. In this study, all three fractions gave positive protein and carbohydrate reactions. Paolins are apparently widely distributed in nature; they have been found in plants and in certain animal tissues, as well as in sea mollusks.

"It is possible that the intake by man or animals of certain foodstuffs rich in paolins plays an important role in the natural defense against certain viral infections," Dr. Li speculated.

## BACKGROUND

Meat of the abalone has been a common food item in China for many generations. A familiarity with this sea animal, which has access to a wide variety of organic material of biological origin, led Dr. Li to consider it as a potentially valuable source of material in which to search for an antimicrobial agent. His work with the abalone, first reported in 1960, showed that commercial canned abalone juice given orally to mice possessed an inhibitory effect against intraspinal infection of types 1 and 3 poliovirus. He also found that crude fresh abalone juice possessed marked inhibitory effect against *Staphylococcus aureus*. Subsequent work at NIH has been done with Dr. Benjamin Prescott, of the National Institute of Allergy and Infectious Diseases.

(Continued on next page.)

Dr. Li then screened a number of sea animals for antimicrobial activity against *S. aureus*, and found that extract of oysters and clams also possessed marked antimicrobial effects.

The next step was the isolation of several fractions from abalone juice by ion exchange chromatography and the discovery that one active fraction was bactericidal, and another fraction was found to be rich in antiviral substance. Dr. Li named the antibacterial substance Paolin 1 and the antiviral substance Paolin 2, from the Chinese word paolin, meaning abalone.

Dr. Li and his associates then switched their attention to the oyster and obtained a substance that possessed both antibacterial and antiviral properties. They found it protected against *Streptococcus pyogenes* infection in mice. The protective effect was much the same against type 1 poliovirus, reducing the paralytic rate from 70 to 40 percent. When mice were fed this substance 24 hours after infection with influenza B virus the death rate from influenza was reduced from 70 to 50 percent.

Although the work of Dr. Li and his associates has been primarily concerned with antiviral substances in sea foods, they have also successfully demonstrated these substances in plant and animal tissue (snow peas and calf thymus). The antiviral agents in these hosts were separated by extraction with either acetic acid or water, and by chromatography.

These antiviral substances are probably representative of a large group of substances occurring in nature in similar or related forms. Thus far, their existence can be detected only by antiviral assay in vitro and in other living organisms.

The mode of action of these substances is unknown. They do not seem to inactivate viruses, nor to prevent the virus from being adsorbed to or penetrating into susceptible cells. They appear to interfere with the replicating process of the virus within the cell.



#### GULF STREAM TO BE SURVEYED BY OCEANOGRAPHIC SCIENTISTS

The Gulf Stream, which flows like a river 40 miles wide and 2,000 feet deep through the Atlantic Ocean, was closely surveyed by scientists during summer 1965.

By understanding more of the forces and patterns of that vast ocean river, scientists will be able to come closer to predicting adjacent changes in the weather and fishing conditions, said the chief oceanographer of the Coast and Geodetic Survey, U. S. Department of Commerce.

The oceanographic program was slated to get under way in July. Scientists participating in the program were to be from the Coast and Geodetic Survey; U. S. Weather Bureau; the Massachusetts Institute of Technology, Cambridge; Woods Hole Oceanographic Institution, Woods Hole, Mass.; University of Rhode Island, Kingston; Lamont Geological Observatory of Columbia University; and the University of Miami. (Science News Letter, April 24, 1965.)







## HIGHLIGHTS IN THIS ISSUE (NOVEMBER 1965)



### Features

DISTRIBUTION, ABUNDANCE, AND SIZE OF SABLEFISH (ANOPLOPOMA FIMBRIA)  
FOUND IN DEEP WATER OFF THE MOUTH OF THE COLUMBIA RIVER--  
Catching of sablefish (p. 1).

SHRIMP POTENTIAL OF THE EASTERN GULF OF GUINEA--  
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Fishes

# COMMERCIAL FISHERIES REVIEW



VOL. 27, NO. 12

DECEMBER 1965

**UNITED STATES DEPARTMENT OF THE INTERIOR**  
**Fish and Wildlife Service**  
**Bureau of Commercial Fisheries**  
**Washington, D.C.**





# COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries  
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor  
G. A. Albano and H. Beasley, Assistant Editors

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5/31/68

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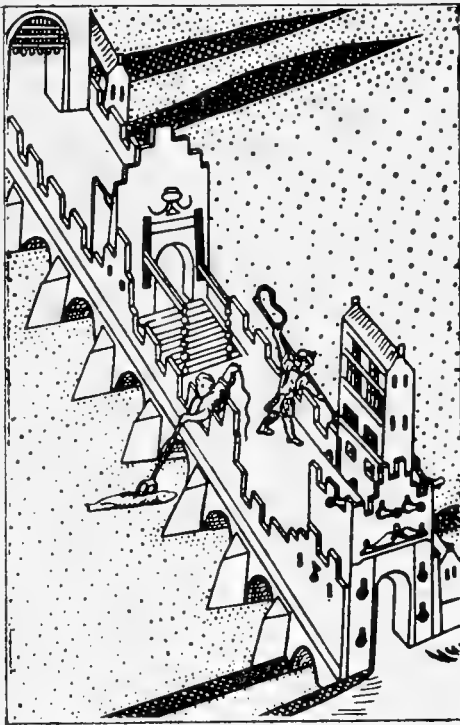
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### IRISH SALMON HAVE BEEN VALUED FOR OVER SEVEN CENTURIES

Since early times, salmon fisheries have been regarded as a source of wealth in Ireland. Irish historical references to salmon date from the 12th century. By the 16th century, salmon fishing rights in Irish rivers were among the most valuable rewards which could be given supporters of the Crown.



Showing the spearing of salmon in 1651 from a bridge in Galway.

The spear was one of the first implements (other than bare hands) used to catch salmon. The "casting spear off the bridge in Galway" was a valuable asset mentioned in the records of the year 1538. But fisheries regulation also has a long history, and the use of spears to take salmon from rivers was banned as early as 1716. The spears were too efficient.

Other fishing methods developed early. Angling with hook and line was sufficiently well established by 1641 for a Dame Elinor Blake to have the right of "one-fourth part of every salmon and trout taken by angling betwixt the bridge and the wood quay near the town of Galway."

Before the middle of the last century, V-shaped structures called head weirs were quite common in the estuaries of many Irish rivers. An early illustration of a weir appears in Thomas Phillips' Military History of Ireland, written in 1685. Weirs in river mouths were later found to be obstructions to navigation and most were declared illegal. Fixed nets in the open sea were introduced off the coast of Ireland in about 1815. These too were later restricted, and today only about 30 are in use on the Irish coast.

The beach seine or haul net is now the most common commercial method of fishing for salmon in Ireland. It is also one of the most ancient. As far back as the reign of King John, such nets were used to supply salmon for the King's kitchen.

A detailed story of fishing for salmon in Ireland under the title "The Pursuit of Salmon in Ireland," has been recently published in the Proceedings of the Royal Irish Academy, Vol. 63, Section C, No. 6. (Irish Times reprint in the Irish Skipper, January 1965.)

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## A JAPANESE GILL-NET FISHERY FOR BOTTOMFISH IN THE GULF OF ALASKA

By George K. Tanonaka\* and Jiro Nišimoto\*

### ABSTRACT

The *Seiju Maru No. 3* was 1 of 4 factoryships authorized by the Japanese Fisheries Agency to fish in the Gulf of Alaska and adjacent areas for bottomfish during the spring and summer of 1963. She was accompanied by three catcher vessels which fished bottom gill nets at depths of 150 to 1,000 meters (492 to 3,280 feet) for rockfishes and sablefish (*Anoplopoma fimbria*). Fishing began April 23 south of Unalaska Island; thereafter to September 20 the fleet moved generally from west to east. Observers from the United States accompanied the fleet to collect data to assist in the evaluation of the effect on Pacific halibut (*Hippoglossus stenolepis*) of fishing for other bottomfish.

Fishing was concentrated on sablefish from early May; success increased as the fleet moved eastward. Sablefish were most abundant between 500 and 900 meters (1,640 and 2,953 feet); blackthroat rockfish (*Sebastes aleutianus*) between 300 and 600 meters (984 and 1,968 feet); and arrowtooth flounder (*Atheresthes stomias*) and Pacific ocean perch (*Sebastes alutus*) between 200 and 500 meters (656 and 1,640 feet). Eighty-six halibut were captured at depths of 200 to 800 meters (656 to 2,625 feet); most were taken between 400 and 500 meters (1,312 and 1,640). With one exception (May 4), halibut catches contributed less than 1 percent of the daily landings. All halibut were dead when landed.

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### INTRODUCTION

To advise on the kinds of information needed to assess the effects on Pacific halibut (*Hippoglossus stenolepis*) of a proposed Japanese fishery for bottomfish in the Gulf of Alaska<sup>1</sup>, the International North Pacific Fisheries Commission (INPFC), at its Ninth Annual meeting in Seattle, November 16, 1962, appointed the Gulf of Alaska Groundfish Committee. The Committee recommended (INPFC Document 601) on February 18, 1963, in Tokyo, Japan, that the official responsibility of compiling, tabulating, and analyzing the commercial catch records be delegated to the Japanese Fisheries Agency. The Committee also recommended that trained observers from Japan, Canada, or the United States collect information supplementary to that contained in fishing logbook records to assist in the evaluation of the effect on halibut of fishing for other bottomfish. In addition, it recommended biological observations on commercially important species.

This report deals with observations and data collected aboard the *Seiju Maru No. 3* factoryship, April 23-September 20, 1963, by two observers from the U. S. Bureau of Commer-

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<sup>1</sup>Under the International Convention for the High Seas Fisheries of the North Pacific Ocean (INPFC 1954), Japan agreed to abstain from fishing for halibut originating along the coast of North America.

cial Fisheries. George Tanonaka was aboard the factoryship on April 27-June 28, and Jiro Nishimoto from June 29-September 20.

### FISHING OPERATIONS

The Seiju Maru No. 3 (table 1), a refrigerated factoryship chartered by the Yutaka Fishing Company of Tokyo, Japan, was accompanied by three catcher vessels which fished bottom gill nets for bottomfish in the Gulf of Alaska and adjacent areas during April-September 1963. This test-fishing with bottom gill nets was conducted to explore the commercial possibilities of capturing bottomfish in areas where depth, bottom topography, and steepness of the continental slope normally prevent trawling.

Table 1 - Positions of Bureau of Commercial Fisheries-Atomic Energy Commission Trawling Stations off the Columbia River, Oreg.

Station Designation	Depth (Fathoms)	Position		Station Designation	Depth (Fathoms)	Position	
		N. Lat.	W. Long.			N. Lat.	W. Long.
1A	50	46°08.2'	124°12.3'	14A	375	45°56.7'	124°51.0'
2A	75	46°07.4'	124°31.6'	15A	400	45°53.6'	124°52.6'
3A	100	46°03.4'	124°39.4'	16A	425	45°59.2'	124°52.1'
4A	125	46°02.2'	124°43.1'	17A	450	45°54.1'	124°55.5'
5A	150	46°02.8'	124°43.8'	18A	475	45°52.2'	124°52.5'
6A	175	45°59.6'	124°44.1'	19A	500	46°02.7'	124°57.3'
7A	200	46°00.3'	124°45.4'	23A	600	45°44.5'	124°53.9'
8A	225	45°58.2'	124°45.0'	25A	650	45°44.3'	124°54.0'
9A	250	45°58.2'	124°46.2'	29A	750	45°36.3'	124°53.7'
10A	275	45°59.9'	124°49.1'	31A	800	46°01.8'	125°04.5'
11A	300	45°57.5'	124°48.8'	33A	850	45°54.0'	125°08.8'
12A	325	45°58.0'	124°50.3'	35A	900	45°50.0'	125°10.6'
13A	350	45°56.0'	124°49.5'	41A	1,050	45°42.2'	125°13.0'

Principal species caught were arrowtooth flounder (*Atheresthes stomias*), Pacific ocean perch (*Sebastes alutus*), blackthroat rockfish (*Sebastes aleutianus*), and sablefish (*Anoplopoma fimbria*). The fleet also "trial-fished" for Pacific herring (*Clupea harengus pallasii*) with surface gill nets during April and occasionally during the remainder of the trip, but had no success.

Table 1a - Vessel Specifications and Complement of Seiju Maru No. 3 Fleet

Name	Type	Tonnage (Metric)	Dimensions (Feet)			Speed (Knots)	Horse-power	Ship's Complement	Navigational Equipment
			Length	Width	Depth				
<u>Seiju Maru No. 3</u>	Refrigerated Factoryship	1,184.2	214.3	36.1	17.4	11	1,700	1/85	Radar, loran, direction-finder, depth-recorder, auto-gyro compass.
<u>Kaiko-Maru No. 2</u>	Catcher	83.7	77.1	17.1	8.7	8	270	18	Radar, direction-finder, depth-recorder.
<u>Kyokko Maru No. 3</u>	Catcher	74.9	79.7	16.1	7.8	9	270	18	Radar, direction-finder, depth-recorder.
<u>Mitsu Maru No. 23</u>	Catcher	84.1	81.0	17.4	8.5	9	270	18	Radar, direction-finder, depth recorder.

1/Personnel of factoryship included 50 fish processors and miscellaneous personnel, 30 ship's crew, and 5 company personnel.

Table 1b - Holding Capacity of Factoryship

Location		Volume		Weight	Utility
		Cubic Feet		Metric Tons	
Below deck	Hold no. 1	1,302.6		19.4	Dry storage
	" " 2	15,309.0		227.5	Gear storage
	" " 3	17,815.9		265.0	Cold storage
	" " 4	17,494.7		260.2	" "
Total		51,922.2		772.1	
Main deck freezing room no. 1		204.7		3.0	Sharp freezing
" " 2		204.7		3.0	" "
" " 3		204.7		3.0	" "
Total		614.1		9.0	

Table 1 gives the vessel specifications and ship's complement of the Seiju Maru No. 3 fleet.

**AREA:** Fishing by the fleet of the Seiju Maru No. 3, as authorized by the Japanese Fisheries Agency, was restricted to an area in the Gulf of Alaska bounded by longitudes 170° W. and 145° W., on the south by latitude 50° N., and on the north by the 150-meter depth contour. Actual fishing, however, was only between the 150- and 1,000-meter (492- and 3,280-foot) depths (fig. 1). The actual fishing areas are divided into statistical areas as determined by the Gulf of Alaska Groundfish Committee.<sup>2/</sup>

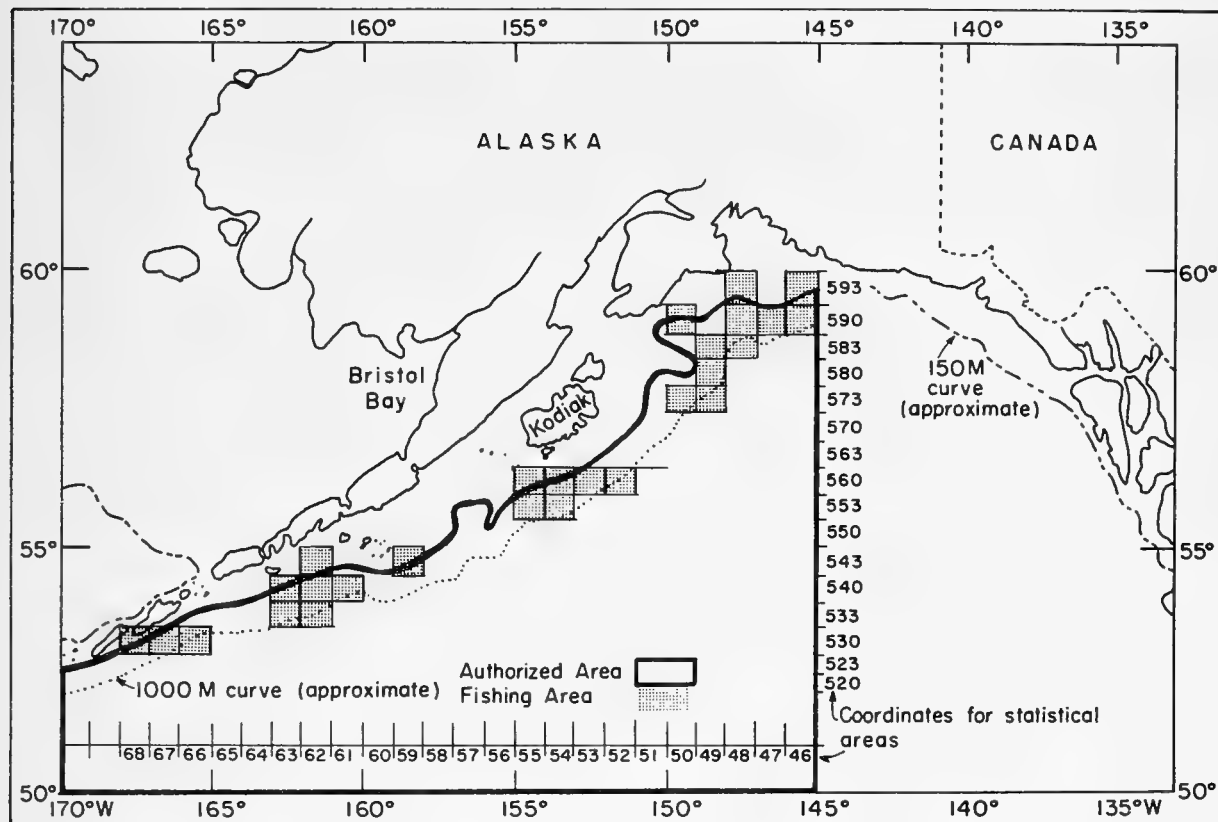


Fig. 1 - Authorized and actual fishing area of the Seiju Maru No. 3, April 24-September 20, 1963.

**GEAR:** Test-fishing by the Seiju Maru No. 3 fleet probably represented the first commercial use of bottom gill nets in Alaskan waters to fish bottomfish. The gear was essentially a gill net constructed to fish 3 feet from the ocean bottom. A tan (shackle) of gear was about 152 feet long and 14 feet deep; mesh sizes ranged from 4.5 to 5.5 inches, stretched measure. The number of tans of various mesh sizes are given below:

Mesh Size (inches)	Number of Tans
4.5 . . . . .	50
4.7 . . . . .	400
*5.0 . . . . .	650
5.4 . . . . .	15
*5.5 . . . . .	85

\*Fished only after July 6.

<sup>2/</sup>Statistical areas include intervals of 1 degree longitude and 30 minutes latitude. Area numbers are prefixed by longitude and are followed by the latitude as shown in fig. 1.

Specifications of the bottom gill net are given diagrammatically in fig. 2. Nets in a string of gear had the same mesh size. Tans of varying mesh sizes were, however, combined to give experimental strings or were incorporated in strings to replace nets lost or damaged.

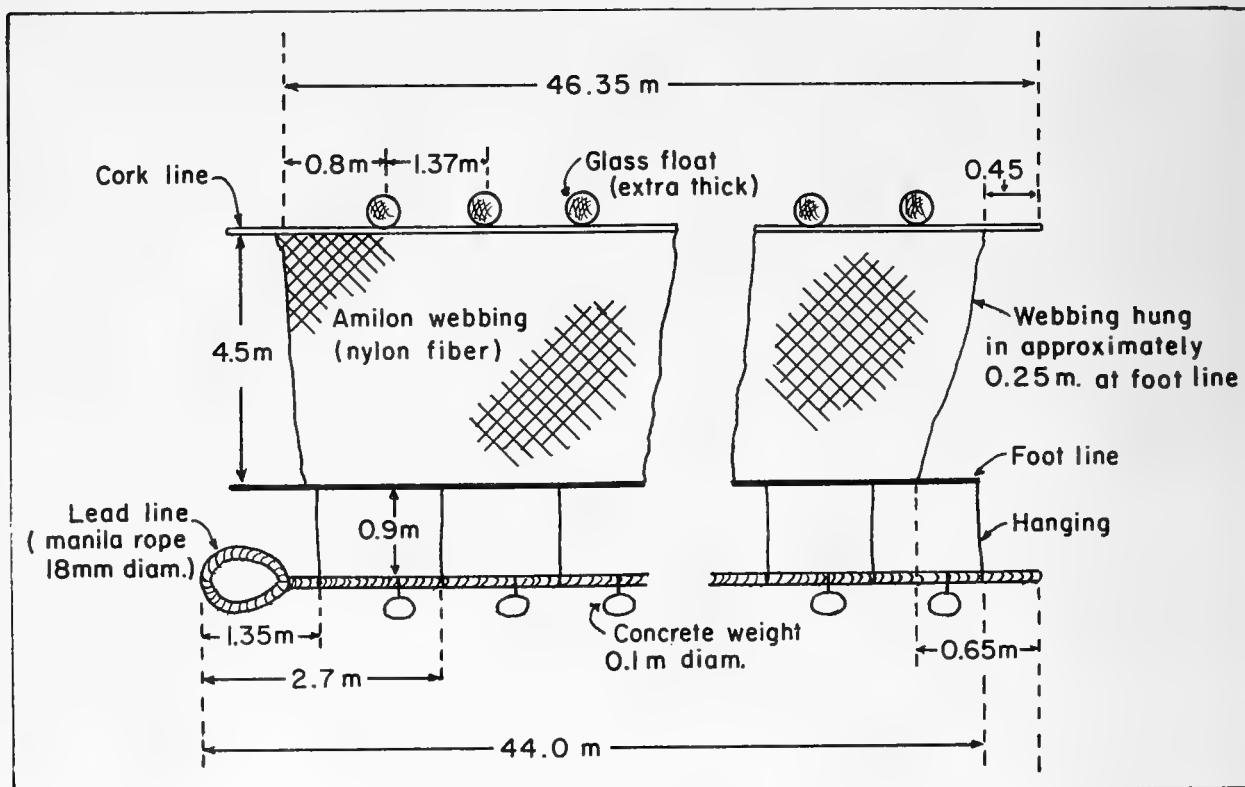


Fig. 2 - Specifications of a bottom gill net.

**METHODS AND TECHNIQUES:** The fleet manager aboard the factoryship directed fishing operations and selected areas to be fished. Analyses of detailed information on catch and coordination of fishing activities were carried out by the fishing-operation officers who, on occasion, boarded catcher boats for observations. The exact location of set, however, was generally left to the discretion of the master fisherman aboard each catcher boat, who considered the following items: character of sea bottom, desired depths, and direction and speed of current.

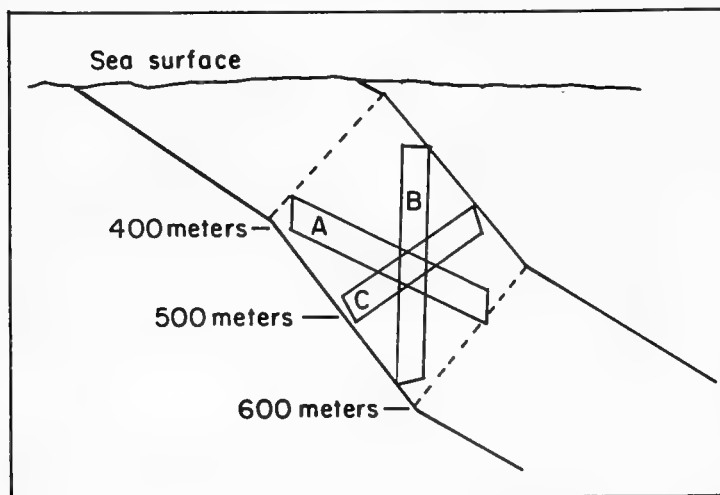


Fig. 3 - An example of trial sets on sea bottom.

Trial sets usually initiated fishing in a new area. In the example of fig. 3, catches made in trial sets "A" or "B" were observed, and if type "A" or type "B" indicated that fish were caught mostly between (for example) 450 and 550 meters, then subsequent sets were made in type "C" position for that area.

Setting of a string of gear normally took 15 to 25 minutes, depending on sea condition and depth. From 25 to 45 tans were set from the stern as the vessel moved forward at about 3 knots (see fig. 4). Items were let out in the order: flag pole and marker floats; hauling rope; anchor; gill nets; anchor; hauling rope; and another marker. A radio buoy usually was attached to one end of the string or to the first marker float (fig. 5).



Fig. 4 - Setting sunken gill nets from stern of a catcher boat.

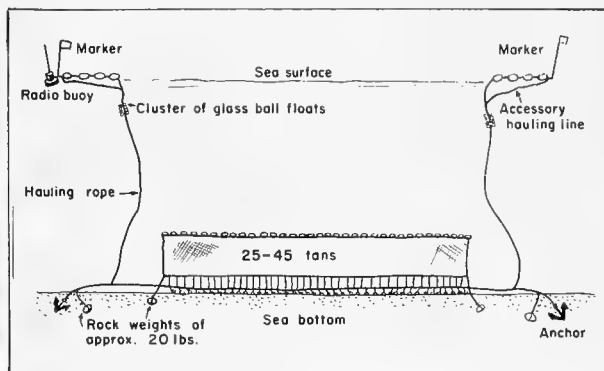


Fig. 5 - A string of gear in a typical set position.

A catcher boat normally set and hauled 2 to 4 strings of gear daily. Strings usually were set at intervals of 3 to 5 miles. The gear was either set during the day and retrieved the following day (or days later), or set and retrieved the same day. Nets were in the water from  $8\frac{1}{2}$  to 48 hours. Size of catch, depth fished, and sea condition were the factors governing the fishing time.

The nets were lifted from the starboard foredeck of the catcher. The marker float and the radio buoy were picked up first with a grappling line or a bamboo pole with a metal hook at the end. A line hauler required  $\frac{1}{2}$  to 1 hour to take in the hauling rope from one end of the string; the string of nets was hauled over the sheave of the line hauler in 1 to 2 hours. As the nets were passed across the foredeck, the weights (either rock or concrete) were removed and the fish cleared from the webbing (fig. 6). The nets were then passed back along the portside through a wooden or sheet-metal chute and over a horizontal bamboo-pole net guide to the rear deck, where they were re-plied in readiness for the next set. The weights were re-tied on the lead line as the nets were being stacked. The total hauling time for a string of gear was 2 to 4 hours, depending on the depth fished, number of fish, and sea condition.

The cylindrical drum line hauler was mechanically driven. Secured on the deck floor, near to the line hauler, was an "open-throated" block used by the fishermen to pull the lead line from the line hauler. A bamboo-pole guard, lashed across the starboard side of the catcher just below the line hauler, guided the net to the gurdy.

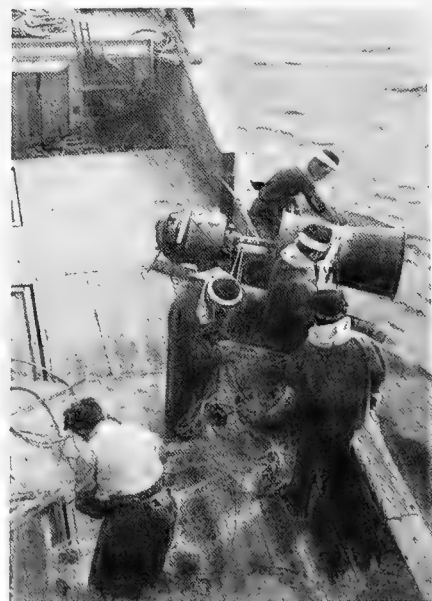


Fig. 6 - Sunken gill nets being hauled aboard a catcher boat.

Seven to 9 crewmen normally worked on the foredeck. One guided the lead line over the sheave, two pulled the lead line from the line hauler and removed the weights, and others removed fish and disentangled the nets. Captured fish, picked out by hand or removed by shaking the net, were stowed in shallow fish holds under the foredeck. When the fish holds were



filled, the remaining fish were left on the foredeck to be placed later into transfer nets. The catchers iced their catch whenever it was not transferred to the factoryship on the day of capture.

**TRANSFER OF CATCH:** After drifting at night, the factoryship ran an average of 10 to 30 miles a day to receive the catch from the catcher boats. The catch usually was transferred in the late afternoon and early evening. In calm or moderate seas, the catcher boat pulled alongside the drifting factoryship to unload her catch and damaged nets (fig. 7). The entire transfer took 10 to 20 minutes. Once aboard, the catch was spilled onto the deck and pushed down to the workers for processing.



Fig. 7 - Transfer of catch from catcher boat to factoryship.

In rough seas, catcher boats were positioned approximately 200 yards from the starboard side of the factoryship. The factoryship then drifted a wire cable, equipped with floats and snap-hook line, out to the catcher. Cargo nets filled with the catch were then attached to the snap-hook line, dumped from the catcher, towed through the water, and brought aboard the factoryship.

### PROCESSING

Selection of species to be retained and processing methods aboard the factoryship depended primarily on market requirements, and, secondarily, on available holding space. Species always retained were sablefish, rockfishes, and arrowtooth flounder.

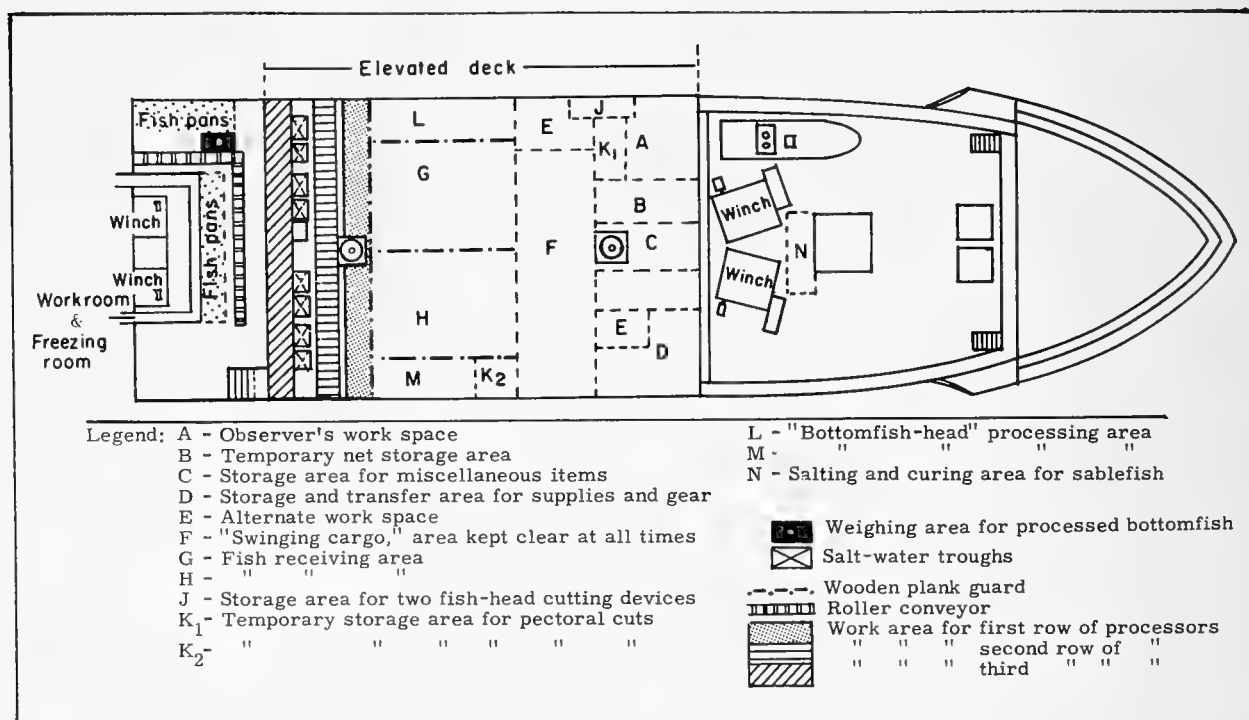


Fig. 8 - Forward section of the *Seiju Maru No. 3*.

Fish were processed on an elevated deck constructed about 3 feet above the regular deck. This elevated deck spanned the width of the foredeck and was about 50 feet long. A center plank-guard 1½ feet high divided the fish receiving area of this operational deck into two sections (areas G and H of fig. 8); those two sections, in turn, had side and front plank guards to retain the catch.

**SABLEFISH:** Sablefish were processed in an assembly-line manner (fig. 9). The 10 workers in the top row cut and gutted the fish; members of the ship's crew working on the unloading deck also assisted. The second row of 12 workers then cleaned the body cavity with metal scoops attached to a continuously flowing sea-water system. Cleaned fish were thrown into troughs of salt water behind those workers. The wooden troughs measured approximately 2½ feet by 1½ feet; a piece of net attached to the trough served as a brail, enabling workmen to rinse and remove the fish by agitating and lifting the net. The third row of workers then sorted and placed the dressed fish into pans of 10- and 20-kg. (22- and 44-pound) capacity. The tails of large sablefish were cut off at this time. Pans were weighed before they were passed into the freezing units on roller conveyers.

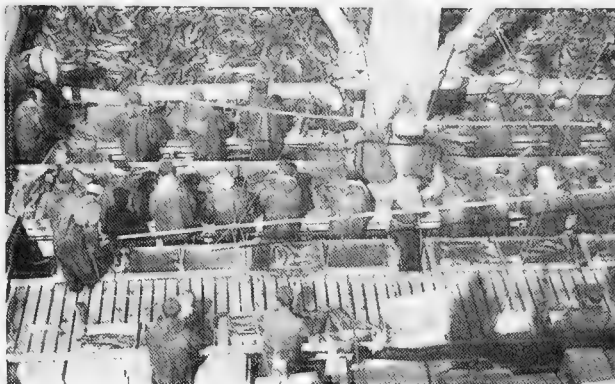


Fig. 9 - Processing fish aboard the factoryship *Seiju Maru No. 3*.

Liver and pectoral sections of sablefish were also prepared (fig. 10). This was done in the side aisles and elsewhere in the unloading areas. Livers were put into pans of 10- and 20-kg. capacity and frozen; pectoral sections were piled on deck to be transferred later by bamboo baskets for washing and freezing. In addition, approximately 300 dressed sablefish (all small) were salted experimentally.

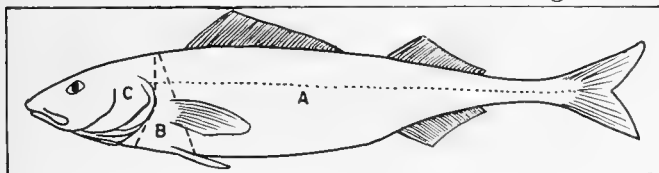


Fig. 10 - Processed sections of sablefish: (A) body section, (B) pectoral section, and (C) waste.

to transfer to the factoryship. Once separated, the rockfish were quickly beheaded by a manually-operated cutter on the port side of the unloading deck (fig. 8), and cut laterally into two unequal portions by workers in the first row. The fish were then cleaned, rinsed, and placed in pans of 10- to 20-kg. capacity for freezing.

**PACIFIC OCEAN PERCH AND ARROWTOOTH FLOUNDER:** Pacific ocean perch and arrowtooth flounder were beheaded, gutted, and frozen. Small arrowtooth flounders were discarded; tails of the larger ones were cut off.

**FREEZING AND PACKAGING:** Temperatures for sharp freezing normally were -28° to -30°C. (-18.4° to -22.0° F.). After about 8 hours, or on the following day--depending on the quantity being frozen--the blocks of fish were removed from the pans, glazed with sea water, and packaged in prelabeled, individual paper cartons. These cartons were then placed in 1 of 2 cold-storage holds to await shipment to Japan via a supply vessel.

#### CATCH RECORDS

In commercial fishing like that of the *Seiju Maru No. 3*, time was too short to record and tabulate exact weights or number of fish captured. Consequently, the catch by weight reported by company officials was based on the following:

1. The approximate numbers of fish captured were noted aboard the catcher boats and converted to weight for each string of gear. The data were radioed to the factoryship immediately after each haul. A record was kept by the fishing-operation officer aboard the factoryship on catch by weight of major species for each string of gear.

Table 2 - Daily Landings of the Seiju Maru No. 3 Fleet, April 24-September 20, 1963

Date	Mothership Noon Position		Catch (Metric Tons)					Halibut <sup>1/</sup>			
			Total Catch	Sable- fish	Arrow- Tooth Flounder	Black Throat- Rockfish	Pacific Ocean Perch	Under 66 cm.		Over 66 cm.	
								Num- ber	Avg. Wt. (Kg.)	Num- ber	Avg. Wt. (Kg.)
April 24	53°40'	164°20'	-	-	-	-	-	-	-	-	-
	53°22'	165°15'	-	-	-	-	-	-	-	-	-
	54°04'	165°00'	-	-	-	-	-	-	-	-	-
	53°25'	165°30'	-	-	-	-	-	-	-	-	-
	54°04'	162°38'	1.3	0.6	-	0.2	0.5	-	-	-	-
	53°53'	163°17'	1.3	1.3	-	-	-	-	-	-	-
	54°11'	161°28'	2.6	2.2	0.2	-	0.2	5	1.6	-	-
Total			5.2	4.1	0.2	0.2	0.7	5	1.6	-	-
May	54°09'	160°44'	5.2	4.8	0.2	0.2	-	8	2.0	3	5.4
	54°03'	162°11'	3.8	3.8	-	-	-	11	1.7	3	3.9
	54°04'	161°35'	2.4	2.2	0.2	-	-	-	-	-	-
	54°15'	159°34'	3.6	3.2	0.2	-	0.2	20	1.9	7	4.2
	53°59'	161°46'	2.2	2.0	0.2	-	-	1	1.2	-	-
	54°03'	161°42'	2.6	2.2	0.4	-	-	-	-	-	-
	54°04'	161°35'	1.8	1.8	-	-	-	1	2.9	-	-
	54°50'	157°27'	3.5	3.5	-	-	-	-	-	-	-
	54°12'	161°17'	2.8	2.8	-	-	-	2	1.6	-	-
	54°13'	160°49'	1.0	0.8	0.2	-	-	-	-	-	-
	54°08'	162°24'	Running to new fishing area								
	55°24'	155°52'	7.2	7.2	-	-	-	-	-	-	-
	56°15'	152°55'	11.2	11.0	0.2	-	-	-	-	-	-
	56°15'	152°58'	13.0	12.6	0.4	-	-	1	2.5	-	-
	56°21'	152°36'	12.6	11.4	1.2	-	-	-	-	-	-
	56°24'	152°30'	7.0	7.0	-	-	-	-	-	-	-
	56°27'	152°08'	5.8	5.6	0.2	-	-	-	-	-	-
	56°24'	152°13'	4.7	4.7	-	-	-	1	1.4	-	-
	56°19'	152°15'	13.2	10.6	-	2.6	-	2	2.6	-	-
	56°24'	152°12'	12.4	9.0	0.8	2.6	-	-	-	-	-
	56°30'	151°50'	3.7	1.9	0.4	1.4	-	-	-	-	-
	56°25'	152°14'	7.2	4.5	0.4	2.3	-	-	-	-	-
	56°32'	151°50'	3.2	1.7	0.2	1.3	-	1	0.9	-	-
	56°29'	152°04'	5.3	4.5	0.4	0.4	-	5	1.9	-	-
	56°21'	152°17'	1.6	0.9	-	0.7	-	-	-	-	-
	56°17'	152°54'	4.1	3.9	0.2	-	-	-	-	-	-
	56°15'	152°45'	2.7	2.3	0.2	0.2	-	-	-	-	-
	55°59'	153°27'	5.4	5.0	-	0.4	-	-	-	-	-
	56°00'	153°26'	8.9	8.7	0.2	-	-	-	-	1	3.5
	56°18'	153°13'	6.7	6.5	0.2	-	-	-	-	-	-
	55°53'	153°47'	4.1	3.7	0.4	-	-	-	-	-	-
Total			168.9	149.8	6.8	12.1	0.2	53	99.5	14	60.8
June	55°53'	153°49'	6.8	6.2	0.4	0.2	-	-	-	-	-
	58°00'	148°28'	8.7	8.7	-	-	-	-	-	-	-
	57°54'	149°14'	4.0	4.0	-	-	-	-	-	-	-
	57°56'	148°59'	12.7	11.4	0.9	0.4	-	-	-	-	-
	57°58'	148°57'	3.2	3.2	-	-	-	-	-	-	-
	57°57'	148°59'	18.1	17.9	0.2	-	-	-	-	-	-
	57°57'	148°57'	13.6	13.2	0.4	-	-	-	-	-	-
	58°00'	148°48'	10.4	10.4	-	-	-	-	-	-	-
	57°58'	148°37'	10.8	10.4	0.4	-	-	-	-	-	-
	57°59'	148°35'	12.3	11.8	0.5	-	-	-	-	-	-
	58°12'	148°38'	6.5	6.5	-	-	-	-	-	-	-
	58°02'	148°30'	14.8	14.8	-	-	-	-	-	-	-
	58°13'	148°27'	13.4	13.4	-	-	-	-	-	-	-
	58°06'	148°29'	15.0	14.8	0.2	-	-	-	-	-	-
	58°19'	148°15'	15.5	14.8	0.4	0.3	-	-	-	1	5.5
	58°18'	148°15'	23.0	22.3	0.2	0.5	-	-	-	-	-
	58°17'	148°21'	14.3	14.1	0.2	-	-	-	-	-	-
	58°24'	148°11'	9.9	9.3	0.4	0.2	-	-	-	-	-
	58°29'	148°08'	13.4	13.4	-	-	-	-	-	-	-
	58°34'	148°05'	16.2	16.2	-	-	-	-	-	-	-
	58°36'	148°00'	12.8	12.8	-	-	-	-	-	-	-
	58°35'	148°02'	12.9	12.9	-	-	-	-	-	-	-
	58°36'	148°08'	8.3	8.1	0.2	-	-	-	-	-	-
	58°34'	148°05'	10.5	10.5	-	-	-	-	-	-	-
	58°38'	147°59'	15.5	15.3	-	0.2	-	-	-	-	-

(Table continued on next page.)

Table 2 - Daily Landings of the Seiju Maru No. 3 Fleet, April 24-September 20, 1963 (Contd.)

Date	Mothership Noon Position		Catch (Metric Tons)					Halibut <sup>1/</sup>			
			Total Catch	Sable- fish	Arrow- Tooth Flounder	Black Throat- Rockfish	Pacific Ocean Perch	Under 66 cm.		Over 66 cm.	
	Lat. N.	Long. W.						Num- ber	Avg. Wt. (Kg.)	Num- ber	Avg. Wt. (Kg.)
June 26	58°37'	148°05'	15.4	15.4	-	-	-	-	-	-	-
27	58°31'	148°03'	14.5	14.5	-	-	-	-	-	-	-
28	58°32'	148°06'	10.2	10.0	-	0.2	-	-	-	-	-
29	58°34'	148°07'	2.0	2.0	-	-	-	-	-	-	-
30	58°22'	148°28'	16.7	15.1	-	1.6	-	-	-	2	22.8
Total			361.4	353.4	4.4	3.6	-	-	-	3	51.1
July 1	58°29'	148°17'	12.8	12.6	0.2	-	-	-	-	-	-
2	58°32'	148°10'	17.6	17.4	-	0.2	-	-	-	-	-
3	58°29'	148°07'	18.4	17.6	0.2	0.6	-	-	-	-	-
4	58°27'	148°14'	16.7	15.7	0.4	0.6	-	-	-	-	-
5	58°12'	148°35'	13.4	12.0	0.6	0.8	-	-	-	-	-
6	57°58'	148°55'	14.3	13.7	0.2	0.4	-	-	-	-	-
7	58°25'	148°57'	6.6	6.6	-	-	-	-	-	-	-
8	57°57'	148°41'	26.3	26.3	-	-	-	-	-	-	-
9	58°00'	148°45'	11.2	11.0	-	0.2	-	-	-	-	-
10	57°57'	148°55'	11.0	11.0	-	-	-	-	-	-	-
11	57°59'	149°02'	15.3	15.1	0.2	-	-	-	-	-	-
12	57°59'	149°02'	15.0	14.8	0.2	-	-	-	-	-	-
13	57°58'	149°01'	14.6	14.6	-	-	-	-	-	-	-
14	57°58'	148°50'	12.5	12.3	-	0.2	-	-	-	-	-
15	57°55'	149°04'	8.6	8.4	-	0.2	-	-	-	2	25.1
16	58°00'	148°34'	2.5	2.5	-	-	-	-	-	-	-
17	58°00'	148°34'	7.0	7.0	-	-	-	-	-	-	-
18	58°08'	148°40'	7.5	7.5	-	-	-	-	-	-	-
19	57°57'	149°00'	0.0	-	-	-	-	-	-	-	-
20	58°11'	148°45'	15.5	15.5	-	-	-	-	-	-	-
21	58°01'	148°55'	5.2	4.8	-	0.4	-	-	-	-	-
22	58°02'	148°45'	7.2	6.8	0.2	0.2	-	-	-	-	-
23	58°11'	148°39'	12.7	12.3	0.2	0.2	-	-	-	-	-
24	58°30'	148°26'	9.5	8.7	0.4	0.4	-	-	-	-	-
25	58°03'	149°30'	13.5	11.5	0.8	1.0	0.2	-	-	-	-
26	58°47'	148°07'	15.7	15.1	0.4	0.2	-	-	-	2	35.5
27	58°21'	148°28'	20.9	19.5	0.6	0.8	-	-	-	-	-
28	58°48'	148°03'	12.5	11.5	0.4	0.6	-	-	-	-	-
29	59°05'	147°53'	26.2	25.2	1.0	-	-	-	-	-	-
30	59°00'	147°50'	21.1	20.7	0.2	0.2	-	-	-	-	-
31	58°59'	147°29'	26.2	25.2	0.6	0.4	-	-	-	-	-
Total			417.5	402.9	6.8	7.6	0.2	0	0	4	121.2
Aug. 1	59°10'	147°41'	17.7	16.7	0.6	0.4	-	-	-	-	-
2	59°08'	147°43'	20.5	20.1	-	0.4	-	-	-	-	-
3	59°11'	147°21'	16.2	16.2	-	-	-	-	-	-	-
4	59°10'	147°14'	8.7	8.7	-	-	-	-	-	-	-
5	59°04'	147°35'	18.4	18.2	-	0.2	-	-	-	-	-
6	59°11'	147°22'	16.8	16.8	-	-	-	-	-	-	-
7	59°11'	147°05'	14.0	13.8	-	0.2	-	-	-	-	-
8	58°50'	147°51'	12.3	12.1	-	0.2	-	-	-	-	-
9	59°12'	146°57'	11.5	11.5	-	-	-	-	-	-	-
10	59°05'	147°41'	12.2	11.8	-	0.4	-	-	-	3	30.4
11	59°11'	147°02'	8.3	7.9	-	0.4	-	-	-	-	-
12	59°15'	146°30'	9.6	9.1	-	0.5	-	-	-	-	-
13	59°18'	146°14'	18.3	17.8	-	0.5	-	-	-	-	-
14	59°17'	146°02'	7.3	6.5	0.2	0.6	-	-	-	2	33.2
15	59°18'	146°19'	10.0	9.2	-	0.8	-	-	-	-	-
16	59°29'	145°44'	18.6	18.6	-	-	-	-	-	-	-
17	59°27'	145°28'	17.8	17.6	-	0.2	-	-	-	-	-
18	59°30'	145°20'	16.2	16.2	-	-	-	-	-	-	-
19	59°29'	145°30'	15.5	15.3	-	0.2	-	-	-	-	-
20	59°25'	145°25'	19.6	19.6	-	-	-	-	-	-	-
21	59°26'	145°23'	13.5	12.9	-	0.6	-	-	-	-	-
22	59°24'	145°30'	18.8	18.0	-	0.8	-	-	-	-	-
23	59°25'	145°22'	18.4	17.6	-	0.8	-	-	-	-	-
24	59°26'	145°21'	11.9	10.9	0.4	0.6	-	-	-	-	-
25	59°25'	145°23'	10.1	10.1	-	-	-	-	-	-	-
26	59°27'	145°24'	6.7	6.5	-	0.2	-	-	-	-	-

(Table continued on next page.)

Table 2 - Daily Landings of the Seiju Maru No. 3 Fleet, April 24-September 20, 1963 (Contd.)

Date	Mothership Noon Position		Catch (Metric Tons)					Halibut <sup>1/</sup>			
			Catch	Sable- fish	Arrow- Tooth Flounder	Black Throat- Rockfish	Pacific Ocean Perch	Under 66 cm.		Over 66 cm.	
	Lat. N.	Long. W.						Num- ber	Avg. Wt. (Kg.)	Num- ber	Avg. Wt. (Kg.)
Aug. 27	59°15'	146°46'	11.9	11.7	0.2	-	-	-	-	-	-
28	59°11'	147°10'	16.4	16.0	0.2	0.2	-	-	-	-	-
29	59°00'	147°40'	18.1	18.1	-	-	-	-	-	-	-
30	59°01'	147°45'	11.0	11.0	-	-	-	-	-	-	-
31	58°59'	148°20'	10.3	10.3	-	-	-	-	-	1	4.5
Total			436.6	426.8	1.6	8.2	0.0	0	0	6	162.1
Sept. 1	58°44'	148°19'	14.2	14.2	-	-	-	-	-	-	-
2	58°40'	148°35'	12.6	12.6	-	-	-	-	-	1	39.3
3	58°40'	148°09'	5.4	5.4	-	-	-	-	-	-	-
4	58°30'	148°23'	20.1	19.1	0.2	0.8	-	-	-	-	-
5	58°30'	148°25'	14.3	14.3	-	-	-	-	-	-	-
6	58°14'	148°30'	2.2	2.2	-	-	-	-	-	-	-
7	58°15'	148°27'	2.1	1.9	0.2	-	-	-	-	-	-
8	58°10'	148°29'	15.9	15.5	0.4	-	-	-	-	-	-
9	58°03'	148°50'	10.7	10.7	-	-	-	-	-	-	-
10	57°48'	149°34'	5.6	5.0	-	0.6	-	-	-	-	-
11	57°48'	149°20'	11.5	11.5	-	-	-	-	-	-	-
12	57°49'	149°32'	13.8	13.4	0.4	-	-	-	-	-	-
13	57°41'	149°45'	8.0	7.8	0.2	-	-	-	-	-	-
14	57°41'	149°28'	4.7	4.5	0.2	-	-	-	-	-	-
15	57°40'	148°51'	6.5	5.7	0.8	-	-	-	-	-	-
16	56°16'	152°43'	1.1	1.1	-	-	-	-	-	-	-
17	55°50'	154°10'	1.7	1.7	-	-	-	-	-	-	-
18	55°54'	153°53'	6.8	6.8	-	-	-	-	-	-	-
19	55°52'	154°01'	7.8	7.8	-	-	-	-	-	-	-
20	55°50'	154°10'	6.4	6.4	-	-	-	-	-	-	-
Total			171.4	167.6	2.4	1.4	0.0	0	0	1	39.3
Grand Total			1,561.0	1,504.6	22.2	33.1	1.1	58	107.5	28	434.5

<sup>1/</sup>Halibut catches were classified according to length (under or over 66 cm. or 26 inches) at the request of the International Pacific Halibut Commission.

2. The total catch landed by a catcher boat was estimated visually by noting the number and fullness of fish-cargo nets transferred to the factoryship. A full net weighed about 1 metric ton.

3. The fish-processing officer aboard the factoryship made the final and most accurate estimate. He periodically sampled the catch by species for round and dressed weight to estimate the percentage discard (waste) per fish. He then was able to use the careful tally that was made of the number of pans of fish by weight and species going into the freezing room to estimate total round weight. His final figures were used as a check against the other two estimates.

**DAILY LANDINGS:** The daily landings in metric tons are given by species, and include the numbers and average weights of halibut (table 2). The reported total catch was 1,561 metric tons for April 24-September 20, 1963. Of that total, 542 kg. (1,000 kg. = 1 metric ton) or 0.03 percent of the total catch was halibut; except for the catch on May 4, halibut catches were less than 1 percent by weight of the daily landings. Sablefish contributed 1,504.6 metric tons, or 96.4 percent of the total catch. Blackthroat rockfish, arrowtooth flounder, and Pacific ocean perch followed in that order of importance.

**CATCH BY STATISTICAL AREA:** A summary of bottom-gill net catches by statistical areas (including the total catch, catch by major species, and catch per tan) is given in table 3. Twenty-seven statistical areas were fished between 145° W. and 168° W. longitude, in which a total of 1,070 strings of gear or 39,265 tans of gill net were set. Halibut were taken in 12 of the 27 statistical areas. The largest number of halibut, 56 fish, was taken in area 62540 and the largest weight of halibut, 178 kg., was taken in area 49583. The greatest amount of effort

Table 3 - Summary of Catches by Statistical Areas (Total Catch, Catch by Major Species, and Catch Per Tan)

Statistical Area	Total Tans Set	All Species		Sablefish		Arrowtooth Flounder		Blackthroat Rockfish <sup>1/</sup>		Pacific Ocean Perch		Halibut			
		Total Catch	Catch Per Tan	Catch	Catch Per Tan	Catch	Catch Per Tan	Catch	Catch Per Tan	Catch	Catch Per Tan	Catch		Fish	Fish Per Tan
		No.	(Kilograms)	No.	(Kilograms)	No.	(Kilograms)	No.	(Kilograms)	No.	(Kilograms)	Total Wt.	Wt. Per Tan		
46590	2,400	110,200	45.92	106,800	44.50	400	0.17	3,000	1.25	-	-	-	-	-	-
46593	1,101	54,800	49.77	54,400	49.41	-	-	400	0.36	-	-	-	-	-	-
47590	1,787	68,991	38.61	65,700	36.77	200	0.11	3,000	1.68	-	-	91	.05	3	.00
48583	698	31,000	44.41	30,500	43.70	200	0.29	300	0.43	-	-	-	-	-	-
48590	4,563	245,205	53.74	241,500	52.93	2,000	0.44	1,700	0.37	-	-	5	.00	1	.00
48593	38	300	7.89	300	7.89	-	-	-	-	-	-	-	-	-	-
49573	2,963	126,350	42.64	122,300	41.28	1,800	0.61	2,000	0.67	200	0.07	50	.02	2	.00
49580	7,301	301,246	41.26	291,100	39.87	4,100	0.56	6,000	0.82	-	-	46	.01	2	.00
49583	3,058	130,478	42.67	126,900	41.50	1,100	0.36	2,300	0.75	-	-	178	.06	5	.00
50573	6,817	282,406	41.43	276,800	40.60	4,100	0.60	1,500	0.22	-	-	6	.00	1	.00
50590	40	3,600	90.00	3,600	90.00	-	-	-	-	-	-	-	-	-	-
52560	145	1,076	7.42	700	4.83	-	-	376	2.59	-	-	-	-	-	-
53560	2,756	75,163	27.27	60,665	22.01	3,684	1.34	10,796	3.92	2	0.00	16	.01	9	.00
54553	160	5,804	36.28	5,700	35.62	100	0.62	-	-	-	-	4	.02	1	.01
54560	1,176	33,502	28.49	31,400	26.70	1,000	0.85	1,100	0.94	-	-	2	.00	1	.00
55553	1,417	44,246	31.22	42,804	30.21	1,236	0.87	202	0.14	4	0.00	-	-	-	-
55560	35	4,400	125.71	4,400	125.71	-	-	-	-	-	-	-	-	-	-
59543	120	976	8.13	678	5.65	30	0.25	68	0.57	200	1.67	-	-	-	-
61540	330	4,068	12.33	3,660	11.09	400	1.21	8	0.02	-	-	-	-	-	-
62533	120	560	4.67	560	4.67	-	-	-	-	-	-	-	-	-	-
62540	1,160	16,726	14.42	15,409	13.28	863	0.74	295	0.25	23	0.02	136	.12	56	.05
62543	160	758	4.74	654	4.09	100	0.62	-	-	4	0.02	-	-	-	-
63533	55	857	15.58	821	14.93	23	0.42	10	0.18	-	-	3	.05	2	.04
63540	715	12,088	16.91	10,515	14.71	429	0.60	257	0.36	882	1.23	5	.01	3	.00
66530	90	626	6.96	200	2.22	208	2.31	100	1.11	118	1.31	-	-	-	-
67530	20	15	0.75	-	-	6	0.30	-	-	9	0.45	-	-	-	-
68530	40	55	1.38	3	0.08	6	0.15	-	-	46	1.15	-	-	-	-

<sup>1/</sup>Incidental catches of *Sebastes* sp. included.

and highest catch per tan were in statistical areas between 145° W. and 150° W. longitude. Sablefish dominated the catch in all but three areas.

**CATCH BY DEPTH:** Records of catches by 100-meter (328-foot) depth intervals (table 4) include the catch per tan of all species combined and of important individual species. Most fishing was between 600 and 800 meters (1,969 and 2,625 feet). Similarly, the greater portion of the total catch (over 66 percent) was taken in that depth interval. The catches per tan were high between 500 and 900 meters (1,804 and 2,953 feet). Halibut were distributed between 200 and 800 meters (656 and 2,625 feet) but were most common between 400 and 500 meters (1,312 and 1,804 feet). Sablefish were caught between 200 and 1,000 meters (656 and 3,281 feet) and catch per tan was highest between 500 and 900 meters (1,312 and 2,953 feet). Arrowtooth flounder and Pacific ocean perch both were abundant between 200 and 500 meters (656 and 1,804 feet), and catches of blackthroat rockfish were best between 300 and 600 meter (984 and 1,969 feet).

Table 4 - Summary of Catches by 100-Meter Depth Intervals (Total Catch, Catch by Major Species, and Catch Per Tan)

Depth (Meters)	Total Tans Set	All Species		Sablefish		Arrowtooth Flounder		Blackthroat Rockfish <sup>1/</sup>		Pacific Ocean Perch		Halibut			
		Total Catch	Catch Per Tan	Catch	Catch Per Tan	Catch	Catch Per Tan	Catch	Catch Per Tan	Catch	Catch Per Tan	Catch		Fish	Fish Per Tan
		No.	(Kilograms)	No.	(Kilograms)	No.	(Kilograms)	No.	(Kilograms)	No.	(Kilograms)	Total Wt.	Wt. Per Tan		
101- 200	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-
201- 300	100	2,173	21.73	1,609	16.09	416	4.16	20	.20	60	.60	68	.68	2	.02
301- 400	1,181	37,068	31.39	29,285	24.80	2,240	1.90	4,492	3.80	977	.83	74	.06	4	.00
401- 500	3,043	97,041	31.89	83,148	27.32	4,008	1.32	9,183	3.02	447	.15	255	.08	61	.02
501- 600	5,481	221,596	40.43	208,760	38.09	4,392	.80	8,444	1.54	-	-	-	-	-	-
601- 700	12,594	518,135	41.14	507,197	40.27	5,804	.40	5,804	.46	4	0	65	.00	3	.00
701- 800	12,721	510,190	40.11	500,770	39.37	4,145	.33	5,269	.41	-	-	6	.00	2	.00
801- 900	3,495	139,619	39.95	139,000	39.77	419	.12	200	.06	-	-	-	-	-	-
900-1,000	70	1,900	27.14	1,900	27.14	-	-	-	-	-	-	-	-	-	-
No depth data	545	27,774	50.96	26,400	48.44	1,300	2.38	-	-	-	-	74	.14	14	.03

<sup>1/</sup>Incidental catches of *Sebastes* sp. included.

**INCIDENTAL CATCH:** The following species were taken incidentally in the bottom gill nets:

Painted greenling . . . . . Oxylebius pictus  
 Spiny dogfish . . . . . Squalus acanthias  
 Dover sole . . . . . Microstomus pacificus  
 Pacific cod . . . . . Gadus macrocephalus  
 Prowfish . . . . . Zaprora silenus  
 Flag rockfish . . . . . Sebastes rubrivinctus  
 Shortspine channel rockfish . . . . Sebastes alascanus

Longspine channel rockfish . . . . Sebastes altivilus  
 Salmon shark . . . . . Lamna ditropis  
 Pacific sleeper shark . . . . . Somniosus pacificus  
 Skate . . . . . Family Rajidae  
 Walleye pollock . . . . . Theragra chalcogrammus  
 Grenadiers . . . . . Family Macruridae  
 Tanner crab . . . . . Chionoecetes sp.  
 . . . . . Anotopterus pharae

**BIOLOGICAL OBSERVATIONS:** Biological data were collected on halibut, sablefish, blackthroat rockfish, and arrowtooth flounder. "Complete" biological records included length, weight, sex, maturity, and stomach contents. In addition, otolith samples, for age determination, were collected from halibut; scale samples were also collected from sablefish in May through July.

Biological data on halibut were transmitted to the International Pacific Halibut Commission.

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## REDUCTION PROCESS TO CONVERT RAW FISH INTO THIAMINASE-FREE PRESS CAKE

By R. H. Gnaedinger\*

### ABSTRACT

Described is a reduction process designed to increase the use of rough fish in conjunction with relatively small fishing operations. Freshly caught fish are processed into press cake, yielding oil and stickwater as byproducts. In the process, fish are heated with live steam to a relatively high temperature in minimum time. Subsequent pressing of the cooked material yields a cake with several useful characteristics. It is in a form that is easy to handle and requires only one-half the storage space of whole fish. It is a valuable feed supplement, owing to its high protein and mineral content, and is safe to feed because it is not thiaminase-active. Consumer acceptance is increased by its uniform composition. The press cake apparently is readily eaten by mink.

### INTRODUCTION

The species composition of fish in the Great Lakes has changed gradually over the years. The food fish of high value have almost disappeared (Brouillard 1960) and have been replaced by less desirable species (alewife, "bloater" chub, and smelt) which have not been used extensively for human food. Because these lower-value species have become highly abundant, or nearly the only fish available, the fishing industry has declined to a point where, to remain vital, it must adopt new or improved products and processes to use its fish profitably.

The pet-food industry uses large amounts of raw fish (Jones 1960), but that market frequently becomes glutted. It could possibly absorb larger quantities, however, if the fish were offered in a uniformly processed, stable form. A significant and large market for fish as mink food has also been established (Jones 1960). Its further development also depends upon products, other than raw fish, that the fur-farming industry can use regularly. Although raw fish is generally regarded as an excellent food supplement for animals, mink ranchers do not always accept it routinely for several reasons. The proximate composition of fish often varies seasonally, which necessitates constant changes in ration formulation. Supplies of fresh fish are not regularly available, owing to the seasonal nature of the fishery. Frozen fish (fresh fish is frozen during glut periods for subsequent use) undergo a gradual lowering of quality during storage. Cooking of the thiaminase-active fish by current methods often lowers the quality of even fresh fish.

Small fisheries, including most of those in the Great Lakes Area, are gravely handicapped because they lack adequate processing methods to convert raw fish into salable processed products. Much of the potential market therefore is closed to them.

This paper describes a reduction process (developed at this laboratory under the process-product development studies on thiaminase-active fish) to convert raw fish into a cooked product that is (1) thiaminase-free, (2) relatively uniform in proximate composition, and (3) apparently suitable as a supplement to rations for mink and other animals. The process, designed to be low-cost and adaptable to any scale of operation, was intended primarily for the production of mink-feed supplements. It is likely, however, that the product can be used to supplement other feeds, like cat and poultry rations. The process, the product, and potential commercial adaptation are described.

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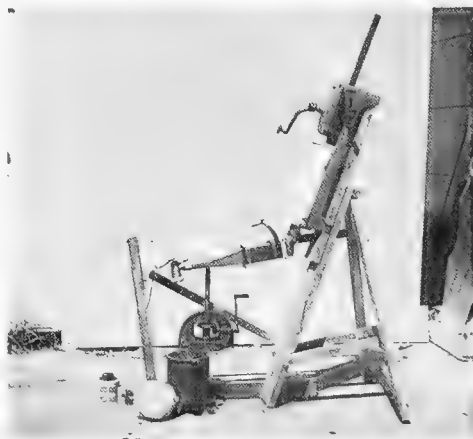


Fig. 1 - Experimental equipment used to convert raw fish into thiaminase-free press cake.

## DESCRIPTION OF PROCESS

The process involves heating ground fish with live steam to a relatively high temperature in minimum time. Subsequent pressing of the cooked material at relatively low pressures yields a "cake" with much of the original water and oil removed. The process also yields press liquor, which can be further processed into salable byproducts, thereby defraying part of the cost of operation.

The equipment consists of (1) a grinder; (2) a stuffer, which serves as a means to force the ground material into the cooker; (3) a cooker; (4) a second grinder, which serves as a means of regulating the flow of material through the cooker; and (5) a press (fig. 2). The process is designed for continuous cooking followed by batch pressing.

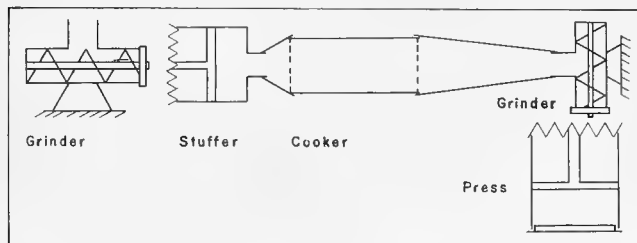


Fig. 2 - Schematic representation of the reduction process.

are positioned so that jets of steam can be delivered uniformly to both sides of the ground material as it passes through the cooker. Under this arrangement, the ground material, through direct contact with live steam, can be heated quickly to a relatively high temperature. Injection of steam in this manner actually serves three purposes: it cooks the material rapidly; it facilitates the movement of the material through the cooker; it aids in the extraction of oil from the cooked fish.

Once the raw ground fish enters the cooker, the steam pressure moves the material through the rest of the system. As a result of this increased pressure, over that provided by the stuffer, the rate of passage of the cooked fish through the cooker tends to be variable. Some mechanism is needed to regulate the flow. In the present arrangement, a small grinder equipped with a plate having holes  $\frac{1}{2}$ -inch in diameter is affixed to the exit end of the cooker. This addition makes it possible to govern the rate of flow (and in turn the rate of cooking). The grinder serves also to disintegrate the coagulated material emerging from the cooker and thus makes a homogeneous mass.

The cooked ground fish emerging from the grinder falls directly into a press cage and is pressed for 5 minutes at a pressure of 10 to 15 pounds per square inch. The cage, constructed of  $\frac{1}{16}$ -inch brass, is insulated to minimize loss of heat during filling and pressing. The pressed material, which is in the form of a cake, is packed in plastic bags and is allowed to cool at room temperature for about 1 hour before being plate-frozen. Immediate packaging of the hot material minimizes contamination of the product during subsequent handling. In the present

The raw fish are first ground through a  $\frac{1}{4}$ -inch plate, and then transferred to a sausage stuffer, which in turn is used to feed the cooker. In the laboratory model, the two operations were done separately, but they could be combined simply by connecting the grinder to the cooker.

The cooker (fig. 3) has a distance of  $\frac{1}{2}$ -inch between the two metal steam plates. The holes in the plates ( $\frac{1}{32}$ -inch diameter)

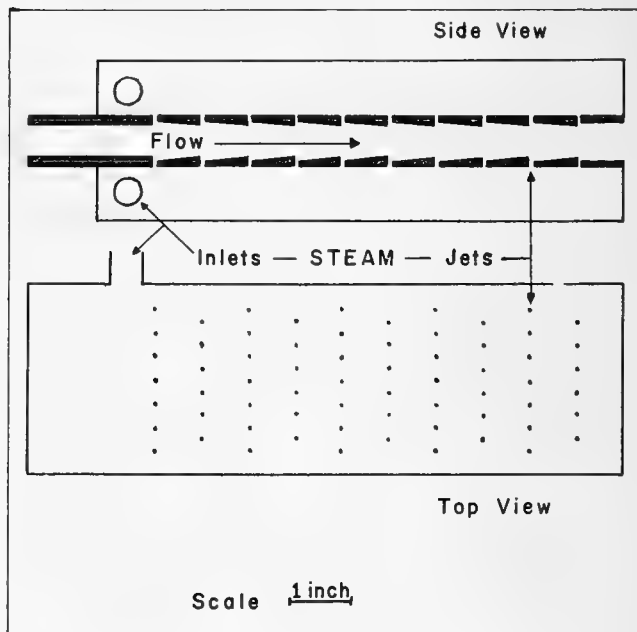


Fig. 3 - Side and top views of the steam cooker.

study, the temperature of the cake was measured immediately after pressing. Depending upon the quality of the raw fish, the yield of press cake was about 50 to 60 percent of the quantity of raw fish used.

### DESCRIPTION OF PRODUCT

To determine the suitability of this process as a potentially useful reduction method, the press-cake products from different species of fish were evaluated from the standpoint of uniformity, residual thiaminase activity, and acceptability by animals.

The table gives the proximate composition of various lots of fresh fish and of their respective cooked products. The results show that raw fish of widely different proximate composition can be rendered into a relatively uniform product. As would be expected, the water and oil contents were decreased while the ash and protein contents were increased. For all species tested, the concentration of water in the raw fish ranged from 61 to 82 percent; whereas, that of the cooked products ranged from 61 to 71 percent. The concentration of oil varied from 2.3 to 22.3 percent in the raw fish; whereas, in the cooked material, the range was 4.1 to 10.1 percent. Thus, the water and oil ranges were reduced considerably in the cooked products. The amounts of oil and water removed during the cooking and pressing processes were directly proportional to the amounts initially present in the raw fish. For example, only a very small amount of oil was removed from smelt; in fact, the cooked material contained more (on a percentage basis) than did the raw fish. In contrast, a very high proportion of the initial amount of oil in carp was removed during processing. In all cases, the concentration of protein and ash increased in the press cake. This increase resulted, of course, from the removal of water and oil, but the data also indicate that no excessive amounts of protein and

Data Relating to Proximate Composition of Certain Fish Before and After Being Processed										
Species 1/	Data on Capture		Proximate Composition of:							
			Raw Fish				Press Cake			
	Date	Location	Moisture	Protein	Oil	Ash	Moisture	Protein	Oil	Ash
			(Percentage)							
Alewife	7/6/64	{ Lake Michigan	72.16	12.04	12.64	2.57	64.30	19.52	7.80	4.71
	9/9/64		74.31	12.75	12.35	2.75	67.30	17.64	8.02	4.17
	9/30/64		74.90	11.99	8.60	2.73	66.96	18.10	7.14	4.70
	10/22/64		72.16	12.11	10.71	2.73	68.29	17.14	7.36	4.03
Carp	3/25/64	{ Lake Erie	64.4	-	16.2	-	63.1	-	7.1	-
	5/20/64		61.05	-	20.51	2.94	61.43	-	9.83	5.99
"Bloater" chub	7/-/64	Lake Michigan	69.13	12.76	14.56	2.17	65.29	20.45	7.65	3.68
Gulf fish	7/19/64	Gulf of Mexico	73.87	14.56	4.50	4.26	63.73	21.80	4.22	6.14
Gizzard shad	1/-/64	Arkansas	72.44	13.74	11.90	2.70	62.47	21.64	8.52	5.84
Gizzard shad: (5.8 fish/lb.) (36.5 fish/lb.)	10/28/64	{ Lake Erie	62.67	12.09	22.25	2.19	62.98	18.67	10.11	3.53
			70.58	12.01	14.16	2.24	-	-	-	-
American smelt	6/29/64	Lake Superior	81.57	11.85	2.34	1.99	70.90	18.04	4.13	3.13
	10/28/64	Lake Erie	75.54	12.71	7.60	2.01	68.87	18.79	6.35	2.70

1/Alewife, *Pomolobus pseudoharengus*; carp, *Cyrinus carpio*; "bloater" chub, *Coregonus hoyi*; gizzard shad, *Dorosoma cepedianum*; American smelt, *Osmerus mordax*; Gulf of Mexico fish, mixture of king whiting (*Menticirhus americanus*), cutlassfish (*Trichiurus lepturus*), spot (*Leiostomus xanthurus*), croaker (*Micropogon undulatus*), sea robin (*Pronotus* sp.).

1/Alewife, *Pomolobus pseudoharengus*; carp, *Cyprinus carpio*; "bloater" chub, *Coregonus hoyi*; gizzard shad, *Dorosoma cepedianum*; American smelt, *Osmerus mordax*; Gulf of Mexico fish, mixture of king whiting (*Menticirrhus americanus*), cutlassfish (*Trichiurus lepturus*), spot (*Leiostomus xanthurus*), croaker (*Micropogonias undulatus*), sea robin (*Prionotus* sp.).

minerals are lost in the process. The composition of a typical sample of stickwater was as follows: 95.2 percent water, 0.3 percent oil, 0.8 percent protein, and 3.4 percent ash. In general, the variation in protein and in ash of the raw and cooked products was about the same, but their concentrations (on a percentage basis) were much higher in the press cake, approximately 50 percent and 70 percent, respectively.

The press-cake products were analyzed for residual thiaminase activity by the chemical method of Gnaedinger (1964). Cakes that had a temperature of 180° F. or above after being pressed were not thiaminase-active. Cakes that did not reach that temperature after pressing were usually thiaminase-active.

The most critical evaluation of the product lies in its acceptance by the animals for which it is intended. Consequently, a sample of alewife press cake was tested for palatability by mink at the U. S. Department of Agriculture Fur Animal Experiment Station at Cornell University. Twenty male mink were divided into two equal groups; each group was fed for 3 days

on either a test- or a control-diet at a rate of 225 grams of feed per day. After 3 days, and after each succeeding 3 day-period for a total period of 12 days, the diets were reversed. The test diet was formulated by replacing the fish of the control diet with alewife press cake. The control diet was that normally used at the Cornell Station for maintenance, and it contained 30 percent by weight of fish. At the end of the 12-day feeding period, the animals had refused 622 grams of the control diet and 448 grams of the test diet. Thus, acceptability appeared to favor the press cake in this test with alewife.

These promising results led to a study of the effects of the press cake on growth and reproduction, which started in June 1964 in cooperation with the Cornell Station. Twenty male and 20 female weaned mink kits were put on an experimental diet containing 30 percent by weight of alewife press cake. A statistical analysis will be made to determine the effects of the experimental diet on growth, fur quality, and reproduction. The results of this study as well as the results of a chemical evaluation of the press cake will be reported later.

#### POTENTIAL COMMERCIAL ADAPTATION

The equipment used in the present pilot study was relatively small. Because of this physical limitation, it was difficult to determine precisely the optimum conditions for a larger-scale operation. The steam for cooking was generated by an electric autoclave, but that device did not have the capacity to maintain a desired head of pressure (5 to 10 p.s.i.). As a result, the maximum possible rate of flow was limited to about 1.5 to 2 pounds of fish per minute. The cooker, even though small, could have handled larger amounts if adequate steam pressure could have been maintained.

The greatest difficulty was in the design and construction of the cooker, which was intended originally to function under continuous pressure. It proved difficult, however, to cook under pressure and at the same time to maintain a uniform and constant flow of material. The small grinder attached to the terminal end of the cooker partially solved the problem, which made it possible to vary the speed of the auger and to obtain the desired pressure and rate of flow. But, even this final arrangement did not entirely eliminate the variable flow of the cooked material, so the steam pressure tended to vary correspondingly.

Batch pressing was preferred for several reasons in addition to its low cost and lower capacity. The cooked material could be pressed and molded into a form convenient for subsequent handling, freezing, and storing. The inactivation of the enzyme thiaminase is a function of time as well as temperature; thus, pressing the cooked material into a cake maintains its maximum temperature over a longer period of time which aids in the destruction of the enzyme. This time-temperature relation applies to the destruction of other enzymes and of bacteria as well.

Several general observations were made regarding the conditions that influenced the cooking process and the effect of certain variables on the composition of the press cake. The temperature attained in the cooked material is important because the compressibility, and in turn the amount of water and oil expressible, is directly proportional to the temperature attained. In general, a minimum product temperature of 180° F. is required to effect satisfactory pressing and to destroy thiaminase. Further, fish that are partially decomposed and those that are frozen and then thawed appear to cook more rapidly than fresh fish. (Fresh fish, however, give the highest yields and the highest quality products). Highly viscous preparations appear to cook faster and are more easily handled than slurries. The pressure applied during pressing affects the composition of the press cake; that is, higher pressures simply remove more water and oil. If the starting temperature of the fish is low, the rate of cooking has to be decreased correspondingly. Other variables, such as particle size, thickness of the fish layer, number of steam jets, and steam pressure, all influence the rate of cooking. Those variables were not investigated in the present study. The reduction unit is currently being scaled up to pilot-production size so that a more thorough evaluation of the entire process can be made.

## CONCLUSIONS

Fish can be cooked very rapidly with live steam by extruding the ground material into a thin layer and forcing it between a series of steam jets. The cooked material can then be pressed relatively uniform in proximate composition under low pressure; the loss of protein and mineral matter is small. A temperature of at least 180° F. is required to effect satisfactory pressing and to inactivate the enzyme thiaminase. The resulting "press-cake" product, which was made from alewife in this study, is readily consumed by mink.

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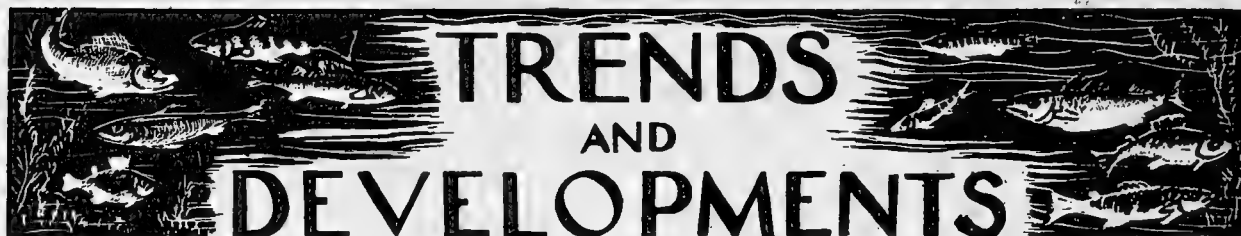
## HISTORY OF SPICED AND PICKLED FISHERY PRODUCTS

Pickling with vinegar and spices is a very ancient form of food preservation, going back to prehistoric times. Stevenson (1899) believes that it probably antedates even pickling with salt. It is mentioned frequently in the writings of the Greeks and Romans, as witnessed by the citations of Smidth (1873) and Radcliffe (1921) in their accounts of the fisheries of the ancients. Certain fishery products prepared with vinegar and spices were considered great delicacies, selling at such high prices that they were reserved for the banquet tables of the rich. One dish popular in Spain and in the Latin American republics of Central and South America today is "escabeche." It is prepared by frying fish in oil with bay leaves and spices, then marinating in vinegar and oil. This dish can be traced directly to the Romans, who in turn had it from the Greeks.

Pickling with vinegar was used extensively down through the Middle Ages, especially for fish that were fat and did not cure well by the very crude salting methods of the times. While the product did not keep so long, it was more appetizing than the dried and salted products of the period. Vinegar-pickled fish played a very important part in the food economy of the north European people down through the seventeenth century.

Brine-salted fish is often called "pickled," but this is a misnomer, if the name as applied to other food products is considered. Pickled foods are fermented in the process of manufacture with the formation of organic acids. If the amount of organic acids formed is not sufficient, more acid may be added in the form of vinegar; or vinegar may be used in the original cure instead of depending on the natural formation of acid. Therefore, only fish preserved with vinegar or vinegar and spices should be considered pickled.

--Excerpted from:  
Spiced and Pickled Seafoods, F. L. 554,  
U. S. Bureau of Commercial Fisheries,  
Washington, D. C.



# TRENDS AND DEVELOPMENTS

## Fishery Technology Developments

### TECHNICAL NOTE NO. 1--A RAPID FIELD METHOD FOR DETERMINING THE SALT CONCENTRATION IN FRESH AND SMOKED CHUB

By R. A. Greig\* and H. L. Seagran\*\*

#### ABSTRACT

A rapid, simple field method for determining the concentration of salt (NaCl) in fresh and smoked chub is described. The method uses an inexpensive plastic indicator device sensitive to chlorides in solution. Results obtained by the field method were compared with those obtained by use of a chemical method known to be accurate. On the basis of these comparisons, the field method was found to be sufficiently accurate for practical purposes.

#### INTRODUCTION

The interim smoked-fish guidelines published late in 1963 by the U. S. Food and Drug Administration called attention to the need for significant changes in existing industry procedures for smoking fish. The results of subsequent industry efforts indicated that an immediate and extreme transition in smoking techniques would make it difficult to produce a fully marketable product (Patashnik, Lee, Seagran, and Sanford 1964). Despite this practical difficulty, however, findings by various researchers since the publication of the smoked-fish guidelines suggest that the interim-thermal-process requirements set forth in the guidelines may be inadequate to ensure the complete destruction of all *Clostridium botulinum* Type E spores that potentially may be associated with raw fish before it is heat-processed. As a result, various research and regulatory groups have examined additional or complementary processing techniques that hold promise of providing industry and consumer protection.

Some agencies have proposed that significantly increasing the salt content of the smoked product may complement thermal processing without altering the marketability of the product. Wisconsin (McDowell 1964) has already amended its regulations to require 5-percent salt in the water phase of the finished product in order to restrict the growth of any botulinum spores surviving the heat treatment. The salt content, however, would have to be controlled within rather narrow limits because of the microbiological hazard if the salt content is too low or of the unpalatability if the salt content is too high. The salt content has been difficult for the smoked fish industry to control closely because of the variability in rate of salt uptake by the fish during brining. A need therefore exists for a rapid method of accurately estimating the concentration of salt in a product during the various steps of processing. Unfortunately, laboratory methods for determining the salt content of fish are time consuming and usually require a technician to perform the tests.

The purpose of this study was to determine if existing quality-control methods employing simple indicator devices that have been used successfully by other industries could be

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applied to the accurate measurement of the concentration of salt in chub (1) during the brining procedure, to guide processors; and (2) in the final smoked product, to determine compliance with microbiological safety requirements.

In the first part of this paper, tests made to determine the suitability of a proposed rapid, simple field method for measuring salt concentration are reported; in the second, the proposed method (having been found adequate) is described in detail.

### TESTS OF THE PROPOSED METHOD

**MATERIALS FOR TESTING:** Chub (*Coregonus hoyi*) from Lake Michigan were brined in various concentrations of salt to obtain products possessing a wide range of salt contents.

Table 1 - Salt Content of Brined Fresh Chub as Determined by a Method Employing an Indicator Device and by the A.O.A.C. Method 1/

Salt Content by Indicator Device, Employing Manual Extraction 2/	Salt Content by A.O.A.C. Method	Salt Content by Indicator Device, Employing Mechanical Extraction 3/	Salt Content by A.O.A.C. Method
Percent	Percent	Percent	Percent
0.56	0.56	0.69	0.64
1.2	1.18	1.5	1.45
1.5	1.57	1.7	1.93
1.8	1.79	2.6	2.56
3.1	3.43	3.6	3.80
3.7	3.98	3.7	4.23
4.1	4.43	-	-

1/From one homogeneous fish sample (corresponding to the various salt levels), separate weight aliquots were taken for the A.O.A.C. and indicator device methods.

2/Hot water and fish mixed with stirring rod.

3/Hot water and fish mixed with electric blender.

Table 2 - Salt Content of Brined Smoked Chub as Determined by a Method Employing an Indicator Device and by the A.O.A.C. Method 1/

Salt Content by Indicator Device, Employing Manual Extraction 2/	Salt Content by Indicator Device, Employing Mechanical Extraction 3/	Salt Content by A.O.A.C. Method
Percent	Percent	Percent
0.80	0.80	0.82
1.3	1.5	1.41
1.4	1.4	1.61
1.6	-	1.69
1.7	-	1.94
2.0	1.9	2.06
2.1	-	2.19
3.3	3.2	3.29
3.5	3.7	3.57
3.6	-	3.92
4.3	4.4	4.23
5.2	-	5.32
6.3	6.0	5.99
5.7	-	6.16

1/From one homogeneous fish sample (corresponding to the various salt levels), separate weight aliquots were taken for the A.O.A.C. and indicator device methods.

2/Hot water and fish mixed with stirring rod.

3/Hot water and fish mixed with electric blender.

The indicator device, which is discarded after a single measurement, was employed as follows: 100 milliliters of boiling distilled water were added to 10 grams of well-mixed fish product. The mixture was stirred immediately, either manually with a stirring rod for 2 to 3 minutes or with an electric blender for 1 minute. Following the filtration of the fish mix-

1/Quantab, type S041; Ames Co., Elkhart, Indiana. (Trade names referred to in this publication do not imply endorsement of commercial products.)

Half of the brined chub at each salt level was smoked in a laboratory controlled smoke-house, and the remainder of each lot was left in the fresh-brined condition. Skin-on loins from the fresh brined chub and skinless loins from the smoked chub were used as material for determining salt concentration.

**TESTING PROCEDURES:** An indicator device 1/ used in quality-control procedures by other industries was used. The indicator is a commercially available plastic strip containing a sensitized capillary element (fig. 1).

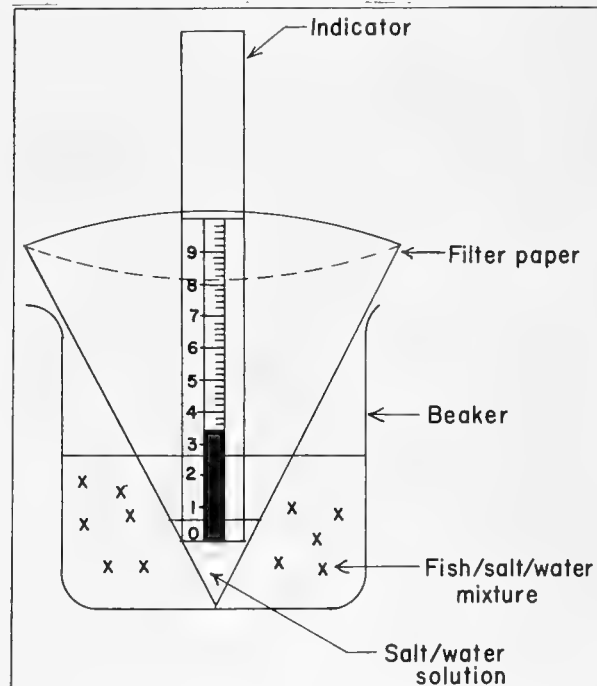


Fig. 1 - Rapid determination of salt (NaCl) concentration by a direct-reading method, showing placement of indicator inside the filter paper cone.

Following the filtration of the fish mix-



ture, the indicator device was placed in a small portion of the filtrate. The percentage of salt was obtained from a standard curve (supplied by the manufacturer of the indicating device), which relates indicator-scale readings (on a semilog basis) to the concentration of salt in the filtered solution.

For comparison, salt concentration (by chloride analysis) was determined on replicate samples of the well-mixed fish product by the official methods of analysis of the Association of Official Agricultural Chemists (A.O.A.C.) (1960) to determine the accuracy of the indicator-test procedure.

**RESULTS: Accuracy of the Indicator Test:** Salt-concentration data (averages of duplicate determinations) resulting from the comparative tests employing both brined fresh chub (table 1) and brined smoked chub (table 2) show that the results using the indicator device correlated well with those obtained with the A.O.A.C. method.

With the brined fresh chub, 11 of the 13 values (85 percent) obtained with the indicator device were within 10 percent of the values obtained by the A.O.A.C. method. The other two values were within 14 percent of those of the reference method. With the brined and smoked chub, 12 of the 14 values (85 percent) obtained with the indicator device were within 8 percent of the values obtained by the A.O.A.C. method. The other two values were within 13 percent of those of the reference method. Further, over 85 percent of the values obtained (24 of the 27) were either the same as, or less than, the values obtained with the A.O.A.C. method.

**Reproducibility of the Indicator Test:** Over 75 percent of the duplicate readings did not vary more than 0.1 unit on the indicator-device scale; the greatest variation observed was 0.3 unit.

**CONCLUSION:** The range of salt-concentration data presented includes those concentrations that would be employed by industry in keeping both with public safety and with palatability. The results obtained when the indicator-test procedure was used show that, when the test is made as described and with the care described below, this simple and rapid method is sufficiently accurate for use in estimating the concentration of salt in both fresh and smoked chub.

#### DETAILED DESCRIPTION OF THE PROPOSED METHOD

The details of the proposed method are as follows:

##### MATERIALS:

- Small food grinder with a plate having holes approximately  $\frac{1}{4}$  inch in diameter
- Triple-beam balance (scale readings to 0.1 gram)
- 250-ml. beakers (or  $\frac{1}{2}$ -pint, wide-mouth jars)
- 100-ml. wide-mouth, graduated cylinder
- 1500-ml. erlenmyer flask (for the boiling of distilled water)
- Distilled water
- Hot plate (or equivalent)
- Glass stirring rods (about 8 inches long)
- Filter paper (Whatman No. 2, 12-cm. size)
- Plastic bags (about 8 by 12 inches)
- Indicator devices

##### PROCEDURE:

1. Grind the skinless loin portion 2/ from smoked chub (or the skin-on loin portion from unsmoked chub, depending on the material to be analyzed) through the food grinder at least two times.

2/Results of recent unpublished work by this laboratory indicates that, for smoked chub, the proper portion of the product to be taken for salt determinations is the loin muscle (the thick meaty part adjacent to the backbone, rather than the meat adjacent to the ribcage). This portion of the fish will contain the minimum salt concentration and maximum moisture and is therefore that part most likely to support the growth of C. botulinum.

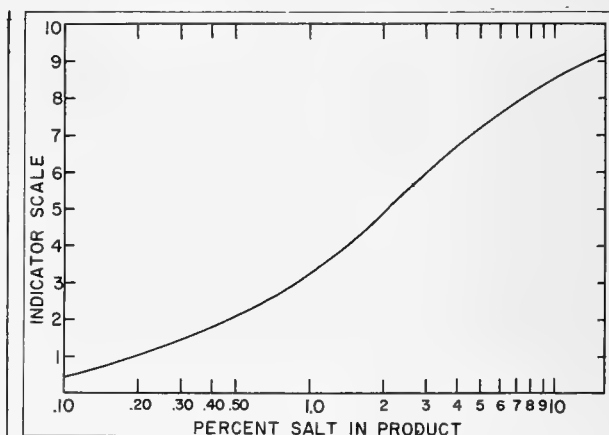


Fig. 2 - Standard curve employed in converting indicator scale reading directly to concentration of salt in product.

2. Place the ground sample in a plastic bag and mix well by kneading the bag.

3. Place 10 grams (accurately weighed to  $\pm 0.1$  gram) of the ground fish in a clean, 250-ml. beaker (or  $\frac{1}{2}$ -pint wide-mouth jar).

4. Add 100 ml. of boiling distilled water to the 10 grams of fish.

5. Mix the fish and water thoroughly with a stirring rod for 2 to 3 minutes, carefully breaking apart any lumps.

6. Fold the filter paper into a cone shape and insert it, pointed end first, into the mixture of fish and water (fig. 1).

7. After a sufficient amount of water passes through the filter paper to wet the bottom of the indicator de-

Note: The salt concentration determined with the standard curve supplied by the manufacturer of the indicator device must be multiplied by 10 to give the salt content of the fish product. This factor has been incorporated in the scale of figure 2.

vice, insert the device into the filtered solution. (The indicator device can be read after about 5 minutes. A marker area at the top of the device turns dark blue to indicate when a reading can be taken. The device contains a printed scale, which is calibrated from 0 to 10).

8. Accurately note the scale reading.

9. Find this number on the indicator scale of the standard curve employed in converting the indicator-scale readings directly to salt content of product (fig. 2).

10. Draw a horizontal line from the number on the indicator scale to intersect the curve.

11. At this point of intersection, draw a vertical line to intersect the percent-salt-in-product scale.

12. Record this value as being the percentage of salt in the product.

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## Transportation and Marketing Aid

### NEW PLASTIC FISH BOXES TO AID FRESH FISH MARKETING:

A new lightweight re-usable plastic fish box for transporting fresh and frozen fish has been developed by a firm in Seattle, Wash. A high-density polyethylene material is used in the new boxes to make them tough and flexible. You can jump on them at 40 degrees below zero without cracking them. They will also withstand steam-cleaning heat.

Particularly adaptable to air shipment, the new containers may offer an excellent opportunity to expand fresh fish markets. The weight of the polyethylene containers is about half that of fiberglass, and they have been approved for re-use by the U. S. Food and Drug Administration. By August 1965, over 2,000 of the new boxes had been sold or leased to 2 airlines based in Seattle, and other airlines were testing the boxes. Using the new containers, an airline transported over 500 tons of fresh fish from Alaska to Seattle during June and July 1965 without a claim for spoiled or damaged fish. In September 1965, an airline announced a one-year experimental rate reduction of 40 percent on Northwest fishery shipments to eastern points.

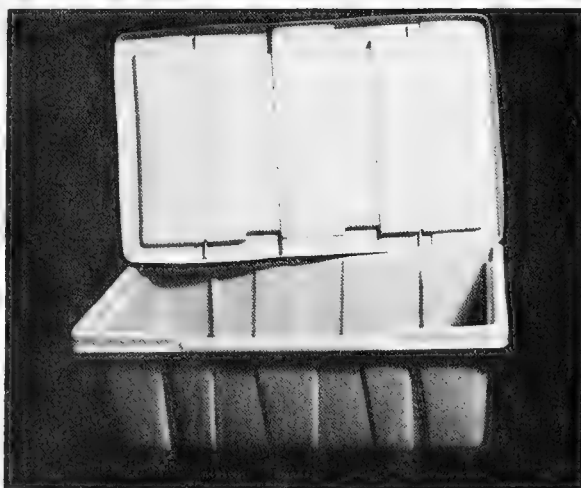


Fig. 1 - New re-usable plastic fish box.

The new containers are available in two sizes. The larger size will hold 250 to 300 pounds of fresh fish and has outside dimensions of  $41\frac{3}{4} \times 21\frac{3}{4} \times 18$  inches. The smaller size holds 125 to 175 pounds of fresh fish and has outside dimensions of  $32 \times 20 \times 11$  inches. Minimum monthly lease costs are said to be 68 cents a box for the larger size and 50 cents a box for the smaller size.

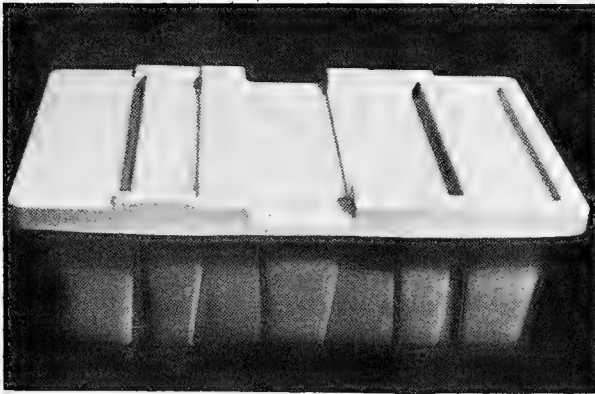


Fig. 2 - Bale-reinforced lid for plastic box gives added strength.

The new boxes are vacuum formed. Strength and rigidity are provided through structural ribbing and bale-reinforced lid. The boxes can be stacked when full and nested when empty.

Notes: (1) Additional information is available from the Marketing Office, U.S. Bureau of Commercial Fisheries, 2725 Montlake Blvd. East, Seattle, Wash.

(2) See page 44 of this issue for a report on an airline's reduced rates for Northwest fishery shipments to eastern points.



## Alaska

### FOREIGN FISHING ACTIVITY OFF ALASKA, SEPTEMBER 1965:

U.S.S.R.: The Soviet Pacific ocean perch trawl fleets operating in the eastern Gulf of Alaska during September 1965 deployed their fishing efforts along the 100-fathom curve from Cape St. Elias to Dixon Entrance. For the first three weeks in September one major fleet of about 41 trawlers, 10 reefers, 1 factoryship, and 1 tanker operated off Yakutat.



Fig. 1 - Soviet trawler transferring Pacific ocean perch to reefer vessel in Gulf of Alaska.

The second fleet of about 27 trawlers, 5 reefers, 1 tug, and 1 cargo vessel was dispersed between Cape Spencer and Cape Ommaney.

Those two major fleets gradually moved south along the coast of Alaska and by the end of the month both fleets had merged into one concentration off Dixon Entrance.



Fig. 2 - Soviet salvage tug.

The Soviet trawlfishery in the central and western Aleutians remained fairly stable throughout September. The fishery in the central Aleutians, composed of 12 trawlers and 3 reefers, remained relatively fixed in the vicinity of Amukta Pass during the month.

In the western Aleutians there was a major concentration of Soviet vessels made up of 16 BMRT factory trawlers, 2 SRT trawlers, 2 reefers, and intermittent support vessels. A notable increase in the size of that fleet occurred during September.

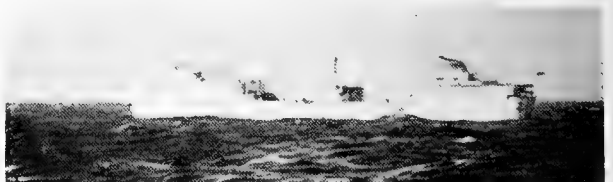


Fig. 3 - Soviet whale factoryship Vladivostok in western Gulf of Alaska.

The two Soviet SRT-M trawlers engaged in shrimp fishing east of the Shumagin Islands ceased operations during the second week of September. It was not known whether those trawlers returned to their home port or were transferred to another fishery.

During September the Soviet whale factoryships Dalniy Vostok and Aleut, each accompanied by 9 whale killer vessels, were operating south of the Aleutian Islands between Adak and Attu. The whale factoryship Vladivostok and its fleet worked in the western Gulf of Alaska during the first week of September. That vessel gradually moved westward and by the end of the month was

working in the Bering Sea north of Semisopochnoi Island.

Japan: During the first week of September, the Japanese vessels Taiyo Maru No. 37, Takachiko Maru, Takachi Maru, and Fukuho Maru No. 2, trawled east of the Trinity Islands; and were joined by the Akebono Maru No. 53. The Daishin Maru No. 12 and the Fukushin Maru No. 1 trawled on Portlock Bank south of Middleton Island throughout the month. The second week of September the Akebono Maru No. 53 moved from Albatross to Portlock Bank and fished in the same general area as the Daishin Maru No. 12. The stern trawler Akebono Maru No. 71 continued to fish in the central Aleutians in the vicinity of Amukta Pass.



Fig. 4 - Japanese stern trawler Akebono Maru No. 71.

In early September the Chichibu Maru and 8 accompanying trawlers returned to the western Aleutians. She fished for Pacific ocean perch in the area around Amchitka Pass until mid-September when she moved to north of the Pribilof Islands and began fishing for shrimp.

Late in September the factory trawlers Aso Maru, Akebono Maru No. 72, and Tenyo Maru No. 3 arrived in the area east of Buldir Island in the western Aleutians. Those vessels were presumably fishing for Pacific ocean perch.

The Japanese fish meal factoryships Gyokuei Maru, Hoyo Maru, and Tenyo Maru continued to fish on the grounds north of the Pribilofs during early September. The Gyokuei Maru and Hoyo Maru, accompanied by



Fig. 5 - Japanese fish meal factoryship Tenyo Maru.

26 and 29 trawlers, respectively, ended operations in mid-September and returned to Japan. The Tenyo Maru and her 10 trawlers remained on the grounds throughout the remainder of the month.

Another Japanese fish meal factoryship, the Shikishima Maru, accompanied by 23 trawlers, arrived in the western Aleutians during the first week of September. She fished in the region east of Attu Island and Amchitka Pass until about September 20 when she presumably returned to Japan.



Fig. 6 - Japanese trawler fishing north of the Pribilofs for the fish meal factoryship Gyokuei Maru.

Throughout September the shrimp factoryship Einen Maru and her 15 trawlers fished in the area about 100 miles north of St. Paul Island. That fleet had been fishing for shrimp in that area since late April 1965.

About the end of the month two Japanese long-line vessels were fishing in the Gulf of Alaska. The Kiku Maru No. 25 was sighted about 25 to 30 miles west of Middleton Island during the second week of September and remained in the Gulf until the end of that month. A second Japanese long-line vessel (IG 1-189) was seen on September 23 south of the Trinity Islands.

The Japanese whale factoryships Nitto Maru and Kyokuyo Maru, each accompanied by 7 catcher boats were reportedly operating in the western Aleutians during the entire month of September.

\* \* \* \* \*

#### NEW FISH PROCESSING PLANT AT HOMER:

The Homer city council has granted a year's option on about two acres of city-owned land to an Alaska fish-processing firm. The land lies on the Kachemak Bay side of Homer Spit next to the Homer city dock. Initially the plant will handle salmon, halibut, shrimp, and king and Dungeness crab. The anticipated annual capacity will be about 20.5 million pounds. If the first stage proves successful, the firm will then begin processing scallops, herring, and clams.



## Alaska Fisheries Explorations and Gear Development

### SHRIMP AND BOTTOMFISH RESOURCES OFF SOUTHEAST ALASKA SURVEYED:

M/V "Commando" Cruise 65-2--Shrimp (July 7-August 2); Bottomfish (August 6-24, 1965): To locate trawlable fishing grounds and to delineate commercial concentrations of shrimp were the primary objectives of this 4-week exploratory cruise in southeastern Alaska by the University of Washington research vessel Commando, which was chartered by the U. S. Bureau of Commercial Fisheries. Secondary objectives included the collection of data on the seasonal distribution and abundance of shrimp in waters off southeastern Alaska.

In the areas of explorations, echo-sounding transects were made to locate trawlable fishing grounds. Areas shown on the echo-recorder to be reasonably level and of soft consistency were fished with the 40-foot Gulf of Mexico-type shrimp trawl.

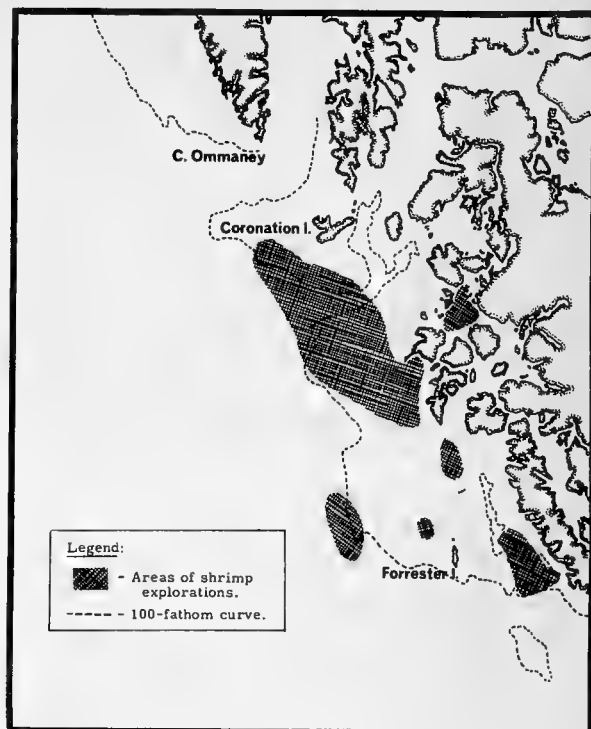


Fig. 1 - M/V Commando cruise 65-2 off southeast Alaska (July 7-August 2, 1965).

A total of 55 drags lasting about 30 minutes each were made during this cruise. Of those, 40 drags were made on the Continental Shelf between Coronation Island and Dixon Entrance in depths ranging from 38 to 153 fathoms. Shrimp catches of 0 to 180 pounds were taken in those offshore areas. Ocean pink shrimp (Pandalus jordani) dominated the shrimp catches, accounting for 83 percent of the total shrimp catch. Side-stripe (Pandalopsis dispar), spot (Pandalus platyceros), and other shrimp accounted for 13 percent, 1 percent, and 3 percent, respectively.

The remaining 15 drags were made in the Gulf of Esquibel (9 drags), Carroll Inlet (4 drags), and Affleck Canal (2 drags) in depths from 22 to 115 fathoms. Shrimp catches ranged from less than a pound to 100 pounds. In those inshore areas, pink shrimp (Pandalus borealis) accounted for 56 percent; side-stripe shrimp, 41 percent; and other shrimp, 3 percent of the total shrimp catch.

After a brief layover in June, the Commando began the summer phase of a general bottomfish survey off southeast Alaska. The cruise ended on August 24, 1965, after 2½ weeks of exploratory fishing operations.

Primary objectives of the bottomfish survey were to determine the ability of roller-rigged otter trawls to fish on rough bottom. Secondary objectives were to locate trawlable fishing grounds and to delineate commercial concentrations of bottomfish.



Fig. 2 - M/V Commando cruise 65-2 off southeast Alaska (August 6-24, 1965).

Sampling gear used was the 400-mesh eastern otter trawl. Accessory gear consisted of a 96-foot length of  $\frac{3}{4}$ -inch diameter wire rope, 18-inch and 14-inch hard rubber rollers, 9-inch rubber wing bobbins, 6-inch rubber spacers, and brass snap purse rings. The rollers, spacers, and purse rings were threaded on the wire rope and the two ends attached to the footrope ends by shackles. Snap purse rings were spaced along the roller gear at one-fathom intervals permitting the entire assembly to be attached or removed from the trawl footrope in a matter of minutes. Total length of the roller gear section was 42 feet--or slightly less than half the length of the trawl footrope.

Echo-sounding transects were made to locate trawlable fishing grounds and areas which appeared to be reasonably level were fished, regardless of the consistency of the bottom. Sounding effort was concentrated on

the Continental Shelf between Noyes Island and Dixon Entrance. A total of 25 drags lasting about one hour each were attempted on bottoms ranging from soft to hard, as shown by the echo-recorder. Though hang-ups were encountered on nine occasions, the net was damaged in only two drags. On several occasions, the roller-rigged trawl was dragged over bottom considered marginal for ordinary trawls without damage to the net. However, further modifications to the trawl and roller gear will be necessary to reduce the high incidence of hang-ups. These include the lightening of the footrope of the trawl; the addition of rollers and spacers to cover the entire length of the footrope; and the use of a single dandy-line hook-up between door and trawl.

No large catches of commercially important bottomfish were made during the cruise. The largest catches were made in a drag two miles south of Cape Addington, where 200 pounds of petrale sole and 120 pounds of English sole were taken; and in another drag in Bucareli Bay, where 200 pounds of rock sole were caught.

\* \* \* \* \*

#### SHRIMP AND KING CRAB RESOURCES STUDIED:

M/V "John R. Manning" Cruise 65-3 (October-December 1965): Shrimp and king crab explorations in the inside waters of southeastern Alaska were to be conducted during a 10-week cruise starting October 4, 1965, by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John R. Manning. Principal objectives were to: (1) locate commercial concentrations of spot shrimp (Pandalus platyceros) and king crab (Paralithodes camtschatica), (2) test the relative fishing efficiency of 7 types of shrimp pots, and (3) collect data on the distribution and abundance of those species.

Plans called for explorations in depths ranging from 10 to 150 fathoms in the inside water surrounding Kuiu Island, the west coast of Kupreanof Island, northwest coast of Prince of Wales Island, and the lower east coast of Baranof Island. Shrimp pots were to be fished using a long-line system having 7 pots to each line; king crab pots were to be fished individually using separate buoys and buoy lines.





## Alaska Fisheries Investigations

### VERTICAL MOVEMENTS OF SHRIMP:

At the Kasitsna Bay biological research station of the U. S. Bureau of Commercial Fisheries, another 24-hour period was spent during September in following the vertical migration of pandalid shrimp. Two vertical strings of pots were fished in 50 fathoms of water. The pots were pulled, emptied, and reset every three hours. As in August, vertical ascent and descent of shrimp coincided with dusk and dawn. Unlike August, when pink shrimp dominated the catch, "humpies" made up most of the catch in September. Also present in larger numbers were male coonstripes which showed night distribution from surface to bottom. Female coonstripes did not leave bottom at any time.

\* \* \* \* \*

### LOW ABUNDANCE OF NORTHERN SOUTHEASTERN ALASKA YOUNG PINK SALMON:

The 1965 cruise series in southeastern Alaska by the research vessel Heron ended on September 10. The absence of juvenile pink salmon in Peril and Chatham Straits was noted. This was considered to show the completion of the 1965 seaward migration of young pink salmon in northern southeastern Alaska. Young pink salmon were present until mid-September in 1963 and 1964.

In 1965 it was only the second year of these comprehensive surveys. However, observations in 1965 confirmed those made in 1964 that local juveniles emigrate through lower Chatham Strait. Following a severe winter, the 1965 salt-water temperatures were as much as 4° F. colder than during summer 1964 and growth of pink fingerlings was significantly less. Euphausiids, which were the major late summer food supply in 1964, were not available in 1965 and large copepods became the primary food. Because the 1965 abundance of northern southeastern Alaska young pink salmon was considerably less along the salt-water migration routes than in 1964, and because the 1964 juveniles produced a low harvest, it might be expected that the harvest in 1966 will again be low and will be comparable to 1960 and 1962.



## American Samoa

### JAPANESE ASSIGN 20 TUNA LONG-LINE VESSELS:

A large Japanese fishing firm in September 1965 assigned to the tuna fishing base at American Samoa 20 100-ton class vessels which had been fishing for the firm's tuna mothership Yuyo Maru (5,043 gross tons). (Note: Yuyo Maru ended operations September 2.) Normally, the catcher vessels would have been assigned to that firm's winter mothership operation, which has been canceled this year. Thus, the assignment of the 20 tuna vessels to American Samoa assures their maximum employment throughout the year.



Japanese long-liner fishing for tuna in Pacific Ocean near American Samoa.

It is reported that the Japanese firm, in arriving at the decision to base the 20 vessels at American Samoa, took into consideration the fact that Japan needs to regain the initiative in negotiating ex-vessel prices with the United States firms operating canneries on that island. The dwindling strength of the Japanese tuna fleet and the increasing strength of the Formosan and South Korean vessels based on that island reportedly had created a situation wherein Japan was steadily losing the initiative in conducting price negotiations.

It is also reported that the Japanese firm is now seriously considering canceling all future mothership-type tuna operations. (Suisan Keizai Shimibun, September 21, 1965.)





## Blue Crab

### CLEANER-DEBACKER MACHINE TO BE TESTED UNDER COMMERCIAL CONDITIONS:

The U. S. Bureau of Commercial Fisheries recently accepted delivery of a machine to deback and clean blue crabs. After extensive testing by the Bureau's Technological Laboratory at College Park, Md., it will be loaned to industry for testing under commercial conditions. The machine was designed and built by the American Scientific Corporation, Alexandria, Va., under a contract with the Bureau.



Cleaner-debacker machine for blue crabs.

Blue crabs now are debacked and cleaned entirely by hand. Because of rising labor costs and the loss of skilled labor to other employment, the shellfish industry along the East and Gulf coasts has experienced diminishing returns in recent years. The machine is equipped to punch through the shell of pre-cooked crabs, taking an amount of lump and flake meat equal to that picked by hand. The crab meat from the punched out portion can then be easily removed by hand. Tests have shown that the machine eliminates several steps of the hand operation.

Research is being continued to develop attachments to the machine which will further automate the blue crab cleaning process. Further research is aimed at devising machinery to remove any flake meat remaining in the crab as well as meat from the claws.

Note: See Commercial Fisheries Review, August 1965 p. 25.



## California

### LONG-RANGE PLAN FOR FISH AND WILDLIFE CONSERVATION AND DEVELOPMENT:

A Fish and Wildlife Plan for California, completed in fall 1965 by that State's Department of Fish and Game, is considered one of the most significant steps yet taken in the management of California's fish and wildlife resources. The Plan includes, for the first time, all the fish and wildlife resources of the State, and all the uses that are made of them. The Plan has been submitted for inclusion in the overall State Development Plan now under way.

Among others, some of the specific programs on major fish species as contained in the Plan include salmon and steelhead. The Plan points out that State control of salmon and steelhead spawning areas must be obtained in order to meet increased recreational demand and maintain the commercial fishery at least at its present level. Also, that greater attention will be given to land-use problems which cause sedimentation and turbidity.

The program for marine resources emphasizes that the problems of marine species are problems of managing human use, rather than managing or protecting habitat. Species use will be managed to produce maximum sustained yield, and methods will be sought to make greater use of underutilized species such as hake through experimental gear development and exploratory fishing. These and other approaches will be used toward the growth and economic development of the commercial fisheries in harmony with the recreational fisheries and other users. Included in the Plan is the establishment of a shellfish research laboratory to devise techniques needed for fuller development and utilization of California's shellfish resource. (California Department of Fish and Game, October 9, 1965.)

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### ANCHOVY FISHING UNDER REDUCTION PERMITS CONSIDERED BY STATE FISH AND GAME COMMISSION:

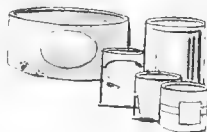
Proposed regulations governing anchovy fishing for reduction purposes were to be considered at a meeting of the California Fish and Game Commission, October 1, 1965, in Los Angeles, Calif. Eight fish processing firms have submitted applications for permits

to take anchovies off California for reduction into fish meal and other byproducts. The proposed regulations concerning permits for anchovy fishing are in the nature of a substitute for anchovy fisheries legislation vetoed by the Governor of California earlier in 1965. (News Release, California Department of Fish and Game, September 25, 1965.)



## Cans--Shipments for Fishery Products, January-July 1965

A total of 1,765,898 base boxes of steel and aluminum was consumed to make cans shipped to fish and shellfish canning plants in January-July 1965 as compared with 1,586,934 base boxes used during the same period in 1964. In 1965, there was an increase in the U. S. canned pack of Maine sardines and Gulf shrimp.



Note: Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14" x 20" size. Tonnage figures for steel (tinplate) cans are derived by use of the factor 23.7 base boxes per short ton of steel.



## Central Pacific Fisheries Investigations

### OXYGEN STUDIES IN RELATION TO CATCHING TUNA:

Skipjack tuna in the eastern Pacific Ocean are caught in profitable commercial quantities with purse seines. In the central Pacific, where skipjack tuna also abound, purse seines are ineffective, and the fishing industry must continue to use the more expensive technique of pole-and-line fishing.

There are several theories as to why that should be true. One holds that sharply decreasing temperatures serve as a barrier, that is, that the thermocline, the thin layer of rapid temperature change between the warm surface layer and the underlying cold water, is not penetrated by the skipjack. During summer 1965 two high school boys, working under the direction of a professional scientist at the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii, gathered interesting data touching on

another theory, that skipjack tuna avoid water of low oxygen content.

The two boys served as Hawaii Junior Science Apprentices in a summer science training program supported by funds from the National Science Foundation. Their supervisor was the head of the Laboratory's investigations in tuna behavior. The object of the study was to investigate the effects of water of low oxygen content on skipjack tuna.

One of the noteworthy differences between the eastern Pacific Ocean and the central Pacific is that in the east the mixed layer of the ocean is quite shallow--about 100 feet. The mixed layer is the uppermost layer of water. In it, temperature maintains a uniform value, and so do salinity and oxygen content.

In the eastern Pacific, oxygen values decrease sharply at the thermocline. From a surface measurement of 4.0 milliliters per liter or more (oxygen content is usually expressed in terms of volume), oxygen valued within and below the thermocline drop to 2.0 or less milliliters per liter.

In the central Pacific, the mixed layer is 200 to 400 feet thick. The oxygen content is as high as it is in the eastern Pacific, but declines only slowly with depth, reaching a value of 2.0 or less milliliters per liter at about 1,500 feet, or 15 times as deep as in the east.

A purse seine is essentially a flexible, floating fence about 200 feet deep. When tuna are surrounded in the central Pacific, they sound beneath the net and dart away. In the eastern Pacific they remain in the upper layers and can be caught. It has occurred to some scientists that in the eastern Pacific the low oxygen levels beneath the thermocline might serve as a floor to the tuna which like the majority of living creatures must have oxygen to survive. The creatures, they suggest, may avoid waters in which the oxygen content is so low that they risk death on entering them. Other kinds of fish have been found to actively avoid water with oxygen concentrations that are lethal to them. In the central Pacific, the creatures could find ample oxygen to 1,500 feet and thus would not be prevented escaping the nets by sounding.

To test the reactions of skipjack tuna to waters differing in oxygen concentrations, the Laboratory's tuna behavior expert and the boys made use of experimental tanks at

the Kewalo Basin facility of the Honolulu Biological Laboratory. Those tanks are supplied with water from a salt-water well. In the experiments, which the high school boys ran, the tanks were filled with oxygenated water. De-oxygenated water was then introduced and mixed to bring oxygen concentration down to a desired level. Next, a skipjack tuna was transferred to the tank. The boys noted the swimming speed of the skipjack and the amount of time it could survive in waters differing in oxygen concentrations.

In discussing the results obtained, the Laboratory's tuna behavior expert emphasizes that the experimental methods need to be much refined before the oxygen concentration lethal to tuna and avoided by them can be determined. Preliminary results suggest, however, that waters with as much as 3 milliliters per liter could be lethal.

In the 10 experiments that were run, it was found that all the fish died that were placed in waters with an oxygen level of 2.0 milliliters per liter. The time the fish survived varied from a few minutes to more than 2 hours, depending possibly on the hardness of the individual fish or the way in which they were transferred to the experimental tanks. The fish increased their swimming speed, almost doubling the rate they maintained in water that was amply oxygenated.

In water in which the oxygen content was 3.0 milliliter per liter, the one fish tested died after a few minutes. Its swimming speed increased. When the water had an oxygen content of more than 3.4 milliliters per liter, the fish tested survived until removed from the tank at the end of the test period (about 8 hours).

Having completed their experiments and summarized them in technical papers, the boys returned to school. Meanwhile, plans are to follow up the interesting clues the boys' summer work provided.

Further problems are faced if it is proved that avoidance of oxygen-poor waters is an aspect of tuna behavior: How else can the fish be kept near the surface, so that they can be caught by seines? Or, if this proves completely infeasible, what methods can be devised to entrap these deep-swimming schools? The Honolulu Biological Laboratory is already conducting research aimed at answering those questions, for other research has pointed to

the existence of large tuna resources in the central Pacific that are at present untouched, and those fish for the most part seem to be in the subsurface layers. The Laboratory's research vessel Townsend Cromwell is being equipped with new sonar equipment in order to study better the vertical and horizontal distribution of tuna of the central Pacific.

Note: See Commercial Fisheries Review, July 1965 p. 20.

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#### SUBMARINE FOR UNDERWATER RESEARCH BRINGS NEW DISCOVERIES:

A small and compact two-man research submarine was leased and used in September and October 1965 by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii, for a 4-week period of research dives. The 16-foot Asherah carries a pilot and one scientist, has a speed of 2.5 knots, and can operate to a depth of 600 feet.

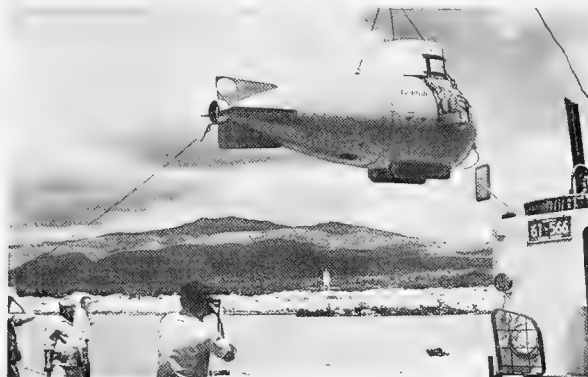


Fig. 1 - The two-man research submarine Asherah was used by the U.S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, for investigations of marine resources off the island of Oahu, Hawaii.

Working only about a mile from shore off the Island of Oahu, she has dramatically shown that submarines offer vast new research opportunities, according to the Bureau's Area Director in Hawaii. He also said that the Asherah has proved the limitations of scientific knowledge gained only by use of traditional surface craft.

Some of the submarine's findings bear directly on underdeveloped fishery resources of the central Pacific. Discoveries made during the Asherah's research dives included: (1) Schools of skipjack tuna, one of the great potential fishery resources of the Pacific, were observed at a depth of approximately 600 feet. It has never been known that they went to such depths. The commercial catch

depends on schools at the surface. (2) The small animals that constitute a part of the floating community (plankton) of the sea and on which fish feed were estimated to be 50 to 100 times as plentiful as data collected from surface vessels indicated them to be. (3) Large lobsters of a size not commonly caught in Hawaii were found in crevices several hundred feet beneath the sea surface. (4) Precious coral never harvested in the islands was believed to have been found growing at great depths.

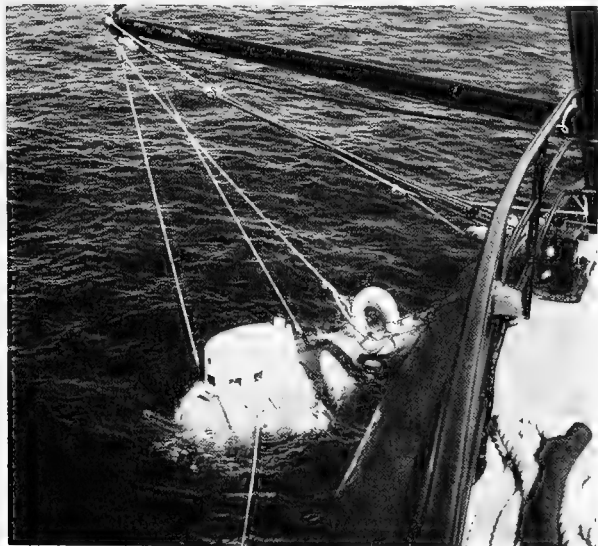


Fig. 2 - Constructed by Electric Boat Division of General Dynamics Corporation, the Asherah can dive to a depth of 600 feet. She communicates with the attending ship by underwater telephone.

The Asherah was delivered to the Honolulu Biological Laboratory on September 16 and began diving on September 18. By the end of that month she had completed 28 dives. These were divided into seven categories: deep-light station, night-light patrol, plankton and forage survey, gear evaluation, bottom resource survey, current measurement, and acoustic survey. In addition, shakedown and demonstration dives were conducted.

Among the other more interesting findings of those dives were: The diving area consisted of a shelving sandy bottom, which deepens from 90 to 380 feet by a series of shallow ledges. Each ledge is a congregating point for fish, and often also represents a cleaning station for the wrasse Labroides. Many of the sandy slopes contain dense beds of Pinna oysters. Sometimes as much as two-thirds of the bottom is devoted to Pinna, with about 50 shells to the square foot. Be-

yond the 350-foot level, the bottom drops away precipitously at an angle of 60° to 80°. Small ledges and boulders provide scant shelter for deeper water fish. Myriads of small fish occur as dense bands along this cliff face from 400 to 600 feet deep, and schools of small tuna, amberjack jack, and snappers prey upon them. Skipjack tuna were observed feeding at about 600 feet. Many animals commonly regarded as inshore forms range down to the deepest diving depth, 630 feet. Plankton were found to be very dense from 200 to 600 feet, with some indications of layering at night. Peculiar behavior (inverted swimming) was noted for opelu (Decapterus pinulatus) between 290 and 360 feet. Current measurements were made by allowing the submarine to drift at selected depths, and the craft was also used for evaluating expendable bathythermographs. Acoustic surveys were undertaken, and various biological sounds, such as fish noises, were recorded. Dives were made both in the daytime and at night.



Fig. 3 - At night, the Asherah is tied to the raft Nenu, seen here. Operations are being conducted close to shore on the leeward side of Oahu.

Limited though the capacities of the Asherah were, the craft has shown the scientific benefits that will reward the more extensive use of submarines in research.



## Federal Purchases of Fishery Products

### DEFENSE DEPARTMENT AMENDS INSPECTION REQUIREMENTS FOR FROZEN RAW BREADED FISH PORTIONS:

New inspection requirements, effective November 1, 1965, for frozen raw breaded fish portions purchased by the U. S. Department of Defense were announced in Headquarters Notice to the Trade No. 110(65) of September 10, 1965, issued by the Defense

Personnel Support Center, Philadelphia, Pa. (That agency absorbed the Defense Subsistence Support Center on July 10, 1965.)

The new inspection requirements are contained in DPSC Articles 341 of October 1, 1965 (which replace DSSC Articles 341 of June 1, 1965), and will be effective with awards made on and after November 1, 1965.

Among other changes indicated in the revised Articles is one that permits an increased weight tolerance for the fish portions.

Copies of the revised inspection requirements for fish portions may be obtained from regional offices of the Defense Personnel Support Center.

Note: See *Commercial Fisheries Review*, Sept. 1965 p. 22, June 1965 p. 19.



## Fisheries Laboratory

### NEW GAME FISH RESEARCH LABORATORY FOR FLORIDA GULF COAST:

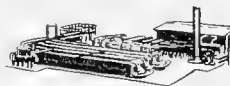
Panama City in Florida was selected by the U. S. Department of the Interior as the site for a new Federal marine game fish research laboratory to be operated by the Bureau of Sport Fisheries and Wildlife, announced Interior's Secretary Stewart L. Udall, October 8, 1965. Estimated cost of the new facility is about \$2 million.

The new laboratory is expected to make a major contribution to sport fishing in the eastern Gulf of Mexico through studies of migratory species of marine game fishes, Secretary Udall said. It will be the latest in a system of coastal research centers authorized by Congress in 1959 to undertake a national research program on salt-water game fish. The goal of this program by the Bureau of Sport Fisheries and Wildlife is to get the answers needed to provide wise conservation and sound management for marine game fish resources.

Marine game fish research laboratories already have been established at Sandy Hook, N. J.; Tiburon, Calif.; and Narragansett, R. I. The fourth and fifth laboratories--the one in Panama City for the eastern Gulf of Mexico and the other in Texas to cover the western Gulf areas--were in the planning and design stages at the time of the announcement. The

exact location of the Texas laboratory has not been determined.

When completed, the five laboratories will provide for a coordinated, nationwide research program aimed at answering many of the problems affecting the Nation's salt-water sport fishing resources, Secretary Udall said.



## Fur Seals

### PRIBILOF ISLANDS FUR SEAL SKIN HARVEST, 1965:

During the 1965 sealing season, the harvest of fur seal skins by the Pribilof Islands staff of the U. S. Bureau of Commercial Fisheries amounted to 51,020 skins. Of that total, 41,216 skins were from males, 6,352 immature females, and 3,452 mature females. In addition, about 1,500 skins were taken for experimental purposes.

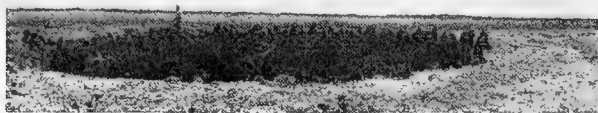


Fig. 1 - A large reserve "pod" of fur seals awaiting selection and harvesting.

The fur seal skin harvest in 1965 was below the 1964 harvest by 13,186 skins. In 1964 a total of 64,206 skins was harvested.



Fig. 2 - Driving a group or "pod" of Pribilof fur seals to the killing field on St. Paul Island.

The fur seal herds on the Pribilof Islands are managed and harvested by the Interior Department's Bureau of Commercial Fisheries which cures the seal skins before shipping them to a processor. Seven-eighths of the harvest goes to the Fouke Fur Company, Greenville, S. C., for processing and sale for the account of the United States. One-eighth

of the harvest is set aside for experimental processing by interested firms.

Note: See Commercial Fisheries Review, November 1964 p. 30.



## Great Lakes

### MICHIGAN PROPOSES CHANGE IN YELLOW PERCH COMMERCIAL FISHING REGULATIONS:

A change to liberalize commercial yellow perch fishing in Saginaw and Tawas Bays to prevent a potentially heavy fish waste is being considered by fisheries officials of Michigan's Conservation Department. The Department would like to loosen regulations so that commercial operators in those waters could be allowed to keep and sell all yellow perch they catch in gill nets of 2½-inch mesh size.

The yellow perch size limit for those nets now is 8½ inches. Experience is showing that the regulation is too restrictive, since about 50 percent of the perch taken are too small. The small perch--most of which measure just under the minimum size limit--must be brought to port by commercial operators. But because they cannot be sold commercially, large numbers of them never reach the market. The Conservation Department is authorized to dispose of undersized perch to charitable institutions, but the supply appears likely to exceed demand if current trends continue, and this points to the possibility of a large waste.

The problem of too many sublegal size fish is tied to the fact that the yellow perch population of the two Bays is stagnated. According to the Conservation Department, those fish grow rather rapidly to about 8 inches but it takes them six years to reach legal size. The Department's fisheries officials say the best way to correct the problems for sport fishermen as well as commercial fishermen is by removing the present size restriction for taking yellow perch with commercial gear. The liberal change, they explain, would encourage more commercial fishermen to profitably harvest perch and, with fishing pressure increased, there would be a more rapid turnover in the perch populations of Saginaw and Tawas Bays. This, in turn, would provide conditions for healthier, faster-growing perch to be harvested by both commercial and sport fishermen.

Another point in the Department's plans is that a revitalized population of yellow perch would be in better condition to resist competition from alewives, members of the herring family which are crowding Great Lakes waters and fast becoming a major nuisance.

A formal recommendation on the matter was scheduled to come before the State of Michigan's Conservation Commission meeting held in Lansing. (Michigan Department of Conservation News Bulletin, Lansing, October 1, 1965.)

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### MICHIGAN PLANS TO INTRODUCE STRIPED BASS IN SOUTHERN WATERS:

Plans of the State of Michigan's Conservation Department to introduce striped bass in the southern Great Lakes were approved in September 1965 by that State's Conservation Commission. The Conservation Department planned to submit its proposed striped bass program to other fishery agencies and the Great Lakes Fishery Commission in late 1965 in hopes of also getting their approval.

According to the Conservation Department's fishery chief, striped bass plantings are scheduled to be started in spring 1966 as a two-in-one approach aimed at providing a new brand of sport fishery and at the same time control alewife populations which are overrunning the Great Lakes. The "striper," a spectacular long-lived fish which grows to 15-20 pounds in 4 or 5 years, is considered the best single hope for weeding out excessive alewife numbers which now account for an estimated 95 percent of the Great Lakes' total fish volume.

It was pointed out to the Commission that the successful introduction of the "striper" is no sure-fire thing, but all signs indicate that the State of Michigan has everything to gain by trying to establish that salt-water species which has made the grade in some fresh waters. Waters of the upper Great Lakes are considered too cold for striped bass, but the Department is attempting to cover all aspects by also introducing coho (silver) salmon during spring 1966 in northern areas. The coho salmon, like the striped bass, feeds heavily on alewives.

In relation to the Department's plans for the striped bass program, the fishery chief stated that Michigan must take a leadership



role in providing recreational fishing in the Great Lakes. With control of the sea lamprey now in prospect, he stressed that the time now is ripe to reorient management goals toward sport fishing interests in the Great Lakes. He noted that state and Federal agencies are very much involved in efforts to re-establish the lake trout in the Great Lakes. But he said the lake trout's recovery may never reach its full potential unless the alewife situation is also controlled because eggs and the young of lake trout may be subject to predation by the alewives. Both the striped bass and coho salmon spawn in streams where their young should be safer from alewife attacks, added the Department's fishery chief. (Michigan Department of Conservation, Lansing, September 23, 1965.)

Note: See Commercial Fisheries Review, April 1965 p. 21.



## Gulf Fisheries Explorations and Gear Development

### SHRIMP GEAR STUDIES CONTINUED:

M/V "George M. Bowers" Cruise 61 (July 21-October 1, 1965): Studies to determine the electrical parameters necessary to deburrow shrimp from various bottom types were continued during this cruise in the northern Gulf of Mexico by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel George M. Bowers. The major objective was to obtain motion picture records of the escape behavior of individual shrimp burrowed in a soft sand substrate when stimulated with different electrical voltages and pulse rates. Another objective was to determine whether or not shrimp escape behavior is affected by the type and compaction of bottom sediments.

Using motion picture cameras, SCUBA divers recorded rates of deburrowing and escape behavior of electrically-stimulated shrimp burrowed in four types of substrata. This consisted of filming more than 600 individually stimulated shrimp on 3,100 feet of 16-millimeter colored movie film. The escape reactions were recorded from white sand, light gray sand, dark gray sand, and soft black mud bottoms. Samples of the bottom sediments were taken at each station and were to be processed to determine sediment size and percent water content. In addition, bottom temperature, salinity, current veloc-

ity, and direction, as well as the attenuation coefficient of light, were obtained for each locality. Diver observations tend to indicate little difference between the escape behavior of shrimp stimulated from the different sand substrata tested up to that time. However, it appears that shrimp escape more readily from black mud substrata than from sand sediments. Further, observations indicate that it is possible to alter shrimp escape reaction by changing the voltage intensity.

Preliminary information on the escape reactions of electrically-stimulated shrimp burrowed in soft and hard sand type bottoms has been obtained from earlier cruises. Data collected on this cruise, when combined with information collected from those earlier cruises, will provide a comprehensive record of the optimum electrical requirements necessary to force shrimp to deburrow from a white sand substrata. Objectives for future cruises of this type will be to determine similar requirements for clay and other type mud and sand bottoms.

Note: See Commercial Fisheries Review, September 1965 p. 28.



## Gulf Fishery Investigations

### SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-33 (September 8-19, 1965): Brown shrimp were predominant in the catches made during this cruise by the chartered research vessel Gus III of the U. S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex. Catches of 21-30 count brown shrimp were good at 25-fathom stations off western Louisiana, although the best catches of 21-30 count brown shrimp were taken off Texas at 11-20 fathoms. White shrimp catches were light, but showed some improvement over those taken during sampling in August 1965. Pink shrimp catches were negligible.

As part of a continuous Gulf of Mexico shrimp distribution study, 7 statistical areas were covered and 24 standard 3-hour tows with a 45-foot flat trawl were made. Other work in the survey area included 41 plankton tows, 34 bathythermograph (BT) and 182 water (Nansen bottle) casts, and 55 bottom grabs.

The largest catch of the cruise was taken in area 18 which yielded 80 pounds of 26-30 count brown shrimp from 11-20 fathoms and



58 pounds of 26-30 count brown shrimp from depths over 21 fathoms. Area 20 produced 72 pounds of 26-30 count brown shrimp from 11-20 fathoms and 46 pounds of 26-30 count brown shrimp from depths over 21 fathoms. Other good catches of brown shrimp (all taken in over 21 fathoms) included 68 pounds of 21-25 count from area 17; 24 pounds of 21-25 count from area 16; and 22 pounds of 41-50 count from area 13.

The best white shrimp catches were taken in areas 13 and 16, both of which yielded 11 pounds of small (over 51 count) white shrimp from depths under 10 fathoms.

After sampling was completed in the eastern survey area, the research vessel Gus III traveled to Key West, Fla., to carry out shrimp-staining experiments for about 1 month. While crossing, an extensive oceanographic survey was made to determine the effects of Hurricane Betsy on the underlying water mass in the northeastern Gulf of Mexico; 41 hydrographic stations were occupied, and 166 bathythermograph casts were made. In addition, 70 Secchi disc readings were obtained.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.  
(2) See Commercial Fisheries Review, Nov. 1965 p. 22.

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Some of the highlights of studies conducted by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex., during July-September 1965:

**SHRIMP BIOLOGY PROGRAM: Shrimp Larvae Studies:** During the quarter, 190 plankton samples collected from January through May 1964 were examined for planktonic-stage penaeid shrimp. Analysis of catch data for this period revealed that planktonic-stage penaeids were distributed throughout most of the survey area and that the overall catch was slightly higher over the western portion of the shelf (Galveston to Port Mansfield) than in the eastern portion (Galveston to the Mississippi River). In addition, the relative abundance of planktonic-stage penaeids showed a distinct decrease from the abundance in the fall of 1963.

Enumeration of the catch of planktonic-stage Penaeus spp. by developmental stage showed that 61 percent were postlarvae, 13 percent mysids, 11 percent protozoae, and 15 percent nauplii. Postlarvae occurred each month, with peak abundance in March, followed by a decrease in numbers through May. They were about three times more abundant in the waters to the east of Galveston than to the west. A gradual shift in postlarval abundance from waters seaward of 25 fathoms to waters shoreward of 15 fathoms was evident after March. Mysis stages were taken throughout the period

but with no apparent depth pattern. Naupliar and protozoal stages (spawning indicators) did not occur in the catch until April followed by a slight increase in numbers during May. These stages were most abundant in the 15- to 25-fathom depth range.

Larvae of the seabob, Xiphopenaeus krøyeri, were reared to postlarvae in mass culture, and sufficient numbers of larvae were preserved for future taxonomic studies. In a feeding experiment, seabob larvae given Gymnodinium splendens, Thalassiosira sp., and Exuviella sp. had better survival than those fed Skeletonema sp. Also, additions of mixed algal cultures gave better survival than additions of their individual components.

Data on the seasonal distribution and abundance of 32 species of fish caught in trawling operations during monthly U. S. Bureau of Commercial Fisheries research cruises off Louisiana and Texas during the period 1962-64 were analyzed during the quarter. All data acquired from biological sampling stations in the waters off Louisiana have been analyzed. Atlantic croaker, Micropogon undulatus, and sea catfish, Galeichthys felis, usually constituted the greatest catch (by weight) on the commercial white shrimp fishing grounds (under 10 fathoms) off Louisiana from 1962 to 1964. Greatest seasonal variation in catches occurred off western Louisiana and the least off central Louisiana.

**Cultivation of Shrimp in Artificial Ponds:** Mass mortality of the brown shrimp, which were stocked as postlarvae, occurred in the circulating-water pond on July 3-4, 95 days from the date of stocking. This kill appeared to be due to a combination of several factors, namely, a phytoplankton bloom, inadequate water circulation, and high water temperature. Approximately 2,000 shrimp (average total length 97.4 mm.), weighing 22.8 pounds, were recovered from the pond. Projection of these figures reveals that the culturing method (circulating water and daily feeding) employed resulted in the production of 210 pounds of shrimp per acre in a 95-day growing period.

In our second pond, in which water is not circulated and food is provided by inducing plankton blooms through the application of fertilizer, excellent shrimp growth was observed for a short period of time. During a 55-day growing period, shrimp made gains equivalent to approximately 118 pounds per acre. They failed, however, to make further gains.

In an attempt to determine whether food was the limiting factor, one-half of the shrimp (1,058 individuals) were transferred from the static pond to the circulating-water pond and fed at the rate of 2 pounds per day. Over a 5-week period, those shrimp revealed a 20-mm. length and 4.5-g. weight increase over those remaining in the static-water pond. Further experiments in which food levels were varied between alternate weeks, showed corresponding growth fluctuations proportional to the level of food supplied.

Postlarval white shrimp were stocked inadvertently with brown shrimp postlarvae in the static-water pond. The growth of white and brown shrimp, expressed as average weight and length at the end of a 120-day period, is compared in this table:

Species	Average length (mm.)	Average weight (g.)
Brown shrimp	79.6	3.5
White shrimp	126.5	14.6

These results suggest that it may be more feasible to rear white shrimp than brown shrimp under semi-natural conditions.

**Movements, Growth, and Mortality of Commercial Shrimps:** The recovery phase of the pink shrimp mark-recapture experiment which started early last spring on the Florida Tortugas grounds is now complete. Of the 11,555 stained shrimp released, 6,059 (52.4 percent) have been recovered. This unusually high proportion of recoveries apparently resulted from the fact that the marked shrimp were released in the center of the fishery during its most active period.

Several groups of stained white shrimp were released in Galveston Bay during July to obtain information concerning their growth and movements. By mid-September, recaptured shrimp amounted to only 7 percent of the 9,448 released.

**Commercial Catch Sampling:** Commercial catch sampling methods at Aransas Pass, Freeport, and Galveston, Tex., were altered during the quarter. A randomized sampling schedule is now being followed in order to reduce biases created by oversampling the landings at some shrimp houses. This sampling scheme is designed to give all vessels an equal chance of being sampled and to provide a means for establishing confidence limits for estimates of catch per unit of effort and the size composition of landings. Agents stationed at the three ports obtained interviews from 49 percent of the 3,613 vessels landing during July and August. Length measurements from a sample of shrimp were collected from 9 percent of the landings.

A cruise was made during the quarter to compare catches made by the Bureau's chartered research vessel Gus III with those of commercial shrimp boats. Thirteen 2-hour trawls and three 1-hour trawls were made in an area off Freeport which was being heavily fished by the commercial fleet. Two 45-ft. flat nets were towed in a manner similar to that used by commercial vessels. The 16 trawl samples made by the Gus III averaged 41.4 pounds of headless shrimp per hour. Information from port samplers shows an average of 40.0 pounds per hour taken by 11 vessels seen fishing in the same vicinity. Forty vessels, whose interviews indicate that they too were fishing near the Gus III, had an average catch of 38.1 pounds of headless shrimp per hour. These findings suggest that interviews provide accurate catch/effort information for specific areas, and that the Gus III can be used satisfactorily as a sampling device to estimate the relative abundance of shrimp in a given area.

**Surveys of Postlarval Abundance and Fisheries for Bait (Juvenile) Shrimp:** Higher than usual numbers of postlarval brown and white shrimp were caught in tows at Galveston Entrance and Sabine Pass during the quarter. In fact, average numbers of postlarval brown shrimp taken at Galveston Entrance during September were higher than the catches for any month of the spring peak of postlarval shrimp movement.

Bait shrimp production in the Galveston Bay system during July and August rose by less than 1 percent from that recorded for the same period in 1964. Effort expenditure for those months, however, increased by 5 percent indicating that fewer shrimp were available to commercial bait-shrimp fishermen during the quarter. Bait-shrimp landings for July and August contained higher percentages of juvenile brown shrimp than dur-

ing the same period in 1964, indicating a smaller crop of white shrimp this year.

**ESTUARINE PROGRAM: Ecology of Western Gulf Estuaries:** Regular hydrological and biological sampling in the Galveston Estuary continued during the quarter at the established sampling locations. The sampling frequency was reduced from weekly to semimonthly after most of the brown shrimp returned to the Gulf. Semimonthly sampling were to continue until late fall, or until the white shrimp leave the estuary.

The bay anchovy was the most numerous of the major species caught during the quarter, followed in descending order by the brown shrimp, white shrimp, croaker, sand sea trout, sea catfish, spot, and blue crab. The relative abundance of those species was considerably different than during the same quarters of 1963 and 1964 when white shrimp ranked first and brown shrimp fifth and fourth, respectively.

Postlarval brown shrimp entered the Galveston Estuary throughout the late winter and spring of 1965 in relatively large numbers. In contrast, during 1964 the invasion was in March and lasted for only a short time. During the period of postlarval recruitment (January-May), more postlarvae were caught per tow during 1965 than in 1964.

We can only speculate at this time that there may be a correspondingly larger harvest in the Gulf of Mexico. A preliminary look at the offshore harvest statistics so far indicates that large volumes of brown shrimp are being caught.

**EXPERIMENTAL BIOLOGY PROGRAM: Behavior and Ecological Parasitology:** Observation of living shrimp under laboratory-controlled conditions has provided new information on burrowing behavior in the two most important commercial species of the northwest Gulf of Mexico. Results indicated that juvenile brown shrimp will burrow in response to gradually reduced temperature. The data suggested a relationship between size of animal and temperature at which burrowing occurs--the larger shrimp (78-80 mm.) responding before the others (50-63 mm.) as temperature declined from 25° to 15° C. (77° to 59° F.).

The suggestion that burrowing is a size-related shrimp response to cold prompted us to extend the size range of test animals to include the smallest shrimp readily available to us. Thus, similar experiments were conducted using postlarval brown shrimp (8½-13 mm.). Those also burrowed when water temperatures were lowered to 16½°-12° C. (61.7°-53.6° F.), if the substrate was sufficiently soft and the rate of temperature change was not too rapid. (Change rates of 1° C. per 5, or more, minutes were satisfactory for the induction of burrowing.) It is particularly interesting to note that postlarval white shrimp collected with the brown postlarvae were unable to burrow under our experimental conditions. Thus, the burrowing habit in postlarval brown shrimp may have special significance as a protective behavioral mechanism which has adapted these organisms, better than white shrimp postlarvae, for survival at reduced temperatures.

Such an interpretation is certainly in keeping with what is presently known of the seasonal differences in postlarval distribution of the two species. The fact that soft substrate texture is required for successful burrowing suggests that physical characteristics of natural

substrates may be an important determinant of brown postlarval survival at late winter or early spring water temperatures.

**Growth and Survival Studies:** Two studies using laboratory-reared postlarvae were conducted--one with pink shrimp and the second with brown. Two temperatures were checked, 25°C. (77°F.) and 33°C. (91.4°F.), with 120 individuals of each species. The salinity in each experiment was about 20‰, which is salinity to which the shrimp were accustomed.

Temperature had a great effect on the growth of both species. Pink shrimp increased, in weight, 120-fold at 25°C. and 770-fold at 33°C. The brown increased, in weight, 460-fold at 25°C. and 1,535-fold at 33°C. The difference in weight increase between the species can be explained partially by the disparity in the initial weights of the animals. The pink initially weighed 0.70 mg. and the brown 0.25 mg.

The survival of the pink shrimp at the temperatures tested was 85 percent at 25°C. and 77 percent at 33°C. The brown shrimp did not survive as well--58 percent at 25°C. and 32 percent at 33°C. This may have been related to the small initial size of the animals.

A study was conducted on the effects of temperature on growth of white shrimp. Nine temperatures were tested in 2.5° increments from 15° C. (59° F.) to 35° C. (95° F.). Growth rate increased generally with temperature from 15° to 32.5° C., with some fluctuation at 27.5°, 30.0°, and 32.5° C. At 35° C., growth rate was between that at 22.5° and 25.0° C. Survival at the two extremes tested (15° and 35° C.) was similar--31 percent and 37 percent, respectively. Survival at all other temperatures was 70 percent or better. The differential effects of temperature on the two species become evident when the results of this experiment are compared with those of a similar study using brown shrimp. At the lowest temperature (15° C.), brown shrimp fared much better than the white. Survival rates of the two species were comparable at temperatures from 17.5° to 27.5° C. The white shrimp survived much better than the browns at 30°, 32.5°, and 35° C.

In the continuing search for a better diet for juvenile and subadult shrimp, further tests were conducted using frozen brine shrimp and fish flour. Neither of those diets gave encouraging results. Animals fed frozen brine shrimp had a mean increase of 1.14 mg. in 27 days, and animals fed fish flour showed a mean increase of 0.71 mg. for the same period. Further studies will be conducted to learn of a suitable diet.

Note: See *Commercial Fisheries Review*, June 1965 p. 22.



## Industrial Fishery Products

### U. S. FISH MEAL, OIL, AND SOLUBLES:

**Production, August 1965:** During August 1965, a total of 40,946 tons of fish meal and 37.7 million pounds of marine-animal oil was produced in the United States. Compared with August 1964 this was an increase of 7,413 tons of fish meal and about 9.4 million pounds of marine-animal oil. Fish solubles produc-

U. S. Production of Fish Meal, Oil, and Solubles, August 1965 1/ with Comparisons				
Product	August		Jan.-Aug.	
	1/1965	1964	1/1965	1964
. . . . . (Short Tons). . . . .				
<b>Fish Meal and Scrap:</b>				
Herring . . . . .	2,944	2,138	9,654	7,098
Menhaden 2/. . . .	33,307	25,973	136,031	125,421
Tuna and mackerel	2,911	1,854	17,163	13,030
Unclassified . . . .	1,784	3,568	14,233	29,811
<b>Total . . . . .</b>	<b>3/40,946</b>	<b>3/33,533</b>	<b>3/177,081</b>	<b>3/175,360</b>
<b>Fish solubles:</b>				
Menhaden . . . . .	15,876	11,944	57,132	54,306
Other . . . . .	2,475	2,724	13,915	17,401
<b>Total . . . . .</b>	<b>18,351</b>	<b>14,668</b>	<b>71,047</b>	<b>71,707</b>
. . . . . (1,000 Pounds) . . . . .				
<b>Oil, body:</b>				
Herring . . . . .	1,870	3,256	6,125	9,193
Menhaden 2/. . . .	34,286	23,513	139,759	122,838
Tuna and mackerel	629	852	2,936	2,839
Other (inc. whale)	951	743	3,764	5,896
<b>Total oil . . . . .</b>	<b>37,736</b>	<b>28,364</b>	<b>152,584</b>	<b>140,766</b>

1/ Preliminary data.

2/ Includes a small quantity of thread herring.

3/ Does not include a small quantity of shellfish and marine animal meal and scrap because production data are not available monthly.

tion amounted to 18,351 tons--an increase of 3,683 tons as compared with August 1964.

\* \* \* \* \*

### Major Indicators for U. S. Supply, August 1965: United States production of fish meal

Major Indicators for U. S. Supply of Fish Meal, Solubles, and Oil, August 1965					
Item and Period	1/1965	1964	1963	1962	1961
. . . . . (Short Tons) . . . . .					
<b>Fish Meal:</b>					
<b>Production:</b>					
August	40,946	33,533	43,609	40,440	57,537
Jan.-Aug. 2/	177,081	175,360	172,613	217,878	223,474
<b>Imports:</b>					
August	13,856	36,543	43,987	28,253	19,026
Jan.-Aug.	242,407	321,835	269,144	194,996	145,562
<b>Fish Solubles 3/:</b>					
<b>Production:</b>					
August	18,351	14,668	19,532	16,811	19,685
Jan.-Aug. 2/	71,047	71,707	80,066	90,525	82,474
<b>Imports:</b>					
August	168	125	-	422	318
Jan.-Aug.	3,521	3,682	2,769	5,018	2,245
. . . . . (1,000 Lbs.) . . . . .					
<b>Fish Oils:</b>					
<b>Production:</b>					
August	37,736	28,364	34,610	33,401	49,671
Jan.-Aug. 2/	152,584	140,766	133,189	176,718	195,935
<b>Exports:</b>					
August	21,206	9,664	37,455	33,272	13,304
Jan.-Aug.	67,521	106,252	164,604	96,405	85,853

1/ Preliminary.

2/ Data for 1965 based on reports which accounted for the following percentage of production in 1964: Fish meal, 89 percent; solubles, 89 percent; and fish oils, 99 percent.

3/ No homogenized fish was produced in 1964 or during the first 8 months of 1965.

and fish oil in August 1965 was higher by 22.1 and 33.0 percent, respectively, as compared with August 1964. Production of fish solubles was higher by 25.1 percent.

\* \* \* \* \*

**Production by Areas, September 1965:**  
Preliminary data as collected by the U. S. Bureau of Commercial Fisheries:

U. S. Production 1/ of Fish Meal, Oil, and Solubles, September 1965 (Preliminary) with Comparisons			
Area	Meal Short Tons	Oil 1,000 Pounds	Solubles Short Tons
<b>September 1965:</b>			
East & Gulf Coasts. . . . .	15,989	15,046	7,214
West Coast 2/ . . . . .	2,320	540	1,428
Total. . . . .	18,309	15,586	8,642
<b>Jan.-Sept. 1965</b>			
Total. . . . .	192,140	163,784	78,680
<b>Jan.-Sept. 1964</b>			
Total. . . . .	198,178	160,546	81,655

1/Does not include crab meal, shrimp meal, and liver oils.  
2/Includes American Samoa and Puerto Rico.

\* \* \* \* \*

**U. S. FISH MEAL AND SOLUBLES:**

**Production and Imports, January-August 1965:** Based on domestic production and imports, the United States available supply of fish meal for the first 8 months in 1965 amounted to 419,488 short tons--77,707 tons (or 15.6 percent) less than during the same

U. S. Supply of Fish Meal and Solubles, January-August 1965			
Item	Jan.-Aug.		Total 1964
	1/1965	1964	
. . . (Short Tons) . . .			
<b>Fish Meal and Scrap:</b>			
<b>Domestic production:</b>			
Menhaden . . . . .	136,031	125,421	160,349
Tuna and mackerel . . . . .	17,163	13,030	21,113
Herring . . . . .	9,654	7,098	8,881
Other . . . . .	14,233	29,811	44,909
Total production . . . . .	177,081	175,360	235,252
<b>Imports:</b>			
Canada . . . . .	28,987	38,678	54,769
Peru . . . . .	201,358	257,604	348,025
Chile . . . . .	5,128	11,082	12,942
Norway . . . . .	49	-	-
So. Africa Rep. . . . .	2,900	11,938	18,581
Other countries . . . . .	3,985	2,533	4,826
Total imports . . . . .	242,407	321,835	439,143
Available fish meal supply . . . . .	419,488	497,195	674,395
<b>Fish Solubles:</b>			
<b>Domestic production 2/ . . . . .</b>			
Imports:	71,047	71,707	93,296
Canada . . . . .	1,095	1,162	1,553
So. Africa Rep. . . . .	-	860	987
Other countries . . . . .	2,426	1,660	1,965
Total imports . . . . .	3,521	3,682	4,505
Available fish solubles supply . . . . .	74,568	75,389	97,801
1/Preliminary.			
2/50-percent solids.			

1/Preliminary.  
2/50-percent solids.

period in 1964. Domestic production was 1,721 tons (or 1.0 percent) more but imports were 79,428 tons (or 24.7 percent) lower than in January-August 1964. Peru continued to lead other countries with shipments of 201,358 tons.

The United States supply of fish solubles during January-August 1965 amounted to 74,568 tons--a decrease of 1.1 percent as compared with the same period in 1964. Domestic production dropped 0.9 percent and imports of fish solubles decreased 4.4 percent.



**Inland Fisheries Explorations and Gear Development**

**OAHE RESERVOIR TRAWLING STUDIES:**

Reservoir Research Vessel "Hiodon"  
**Cruise 2 (August 1965):** To delineate areas for effective bottom trawling and collect catch and biological data was the primary purpose of this exploratory cruise in Oahe Reservoir located in South and North Dakota. This intermittent 20-day trawling operation by the reservoir fishery research vessel Hiodon of the U. S. Bureau of Commercial Fisheries was completed on August 17, 1965.

Bottom tows were made in zones 3, 4, and 6 between reservoir miles 70 to 124. Only 22 tows lasting 15 minutes each were completed during the cruise. Large quantities of organic debris were taken in some tows which greatly reduced fish catches. Six tows were incomplete due to large trees taken in the trawl. All but one trawl was torn badly during the cruise.

**FISHING OPERATIONS:** Twelve 15-minute tows were made with a 55-foot (headrope length) bottom trawl and 9 tows were made with a 35-foot bottom trawl. Mesh size (extended measure) of the cod end of both trawls was 1 1/4 inches but the 35-foot trawl contained a 1/2-inch mesh liner in the cod end. All but one tow was made over inundated bottomlands or pastures, with depths trawled ranging from 12 to 85 feet.

**FISHING RESULTS:** With the 35-foot trawl, 9 tows were made at depths less than 61 feet which yielded 5,883 fish (age group II or older) weighing 1,252.6 pounds. Average catch

per 15-minute tow was 654 fish and 139 pounds. The total weight of the catch consisted of 38.9 percent yellow perch (6-7 inches long--mostly the 1963 year-class), 30.7 percent carp (1 to 2 pounds--mostly the 1962 year-class), 6.8 percent carpsuckers, 5.7 percent black bullheads, 4.7 percent drum, and 4.0 percent goldeye. One tow fished at 80 feet caught 5 fish that weighed 2.3 pounds. The rate of catch tended to decrease with an increase in depth. The largest single catch of yellow perch was 398.2 pounds and of carp 132.9 pounds.

Young-of-the-year and yearling fish were counted and weighed in the catches of 8 tows with the 35-foot trawl. The 8,050 young-of-the-year fish caught consisted of 7,261 yellow perch, 780 crappie, 7 northern pike, and 1 each of goldeye and burbot. The 83 yearling fish consisted of 29 yellow perch, 21 carpsuckers, 12 black bullheads, 8 each of crappie and sauger, 3 common suckers, 2 goldeye, and 1 carp.

A total of 12 tows with the 55-foot trawl yielded 1,598 fish that weighed 861 pounds. The average catch per tow was 133 fish and 71.8 pounds. The average catch in pounds for different depths was: 181.0--12 to 30 feet; 14.0--35 to 60 feet; and 26.5--80 to 85 feet. The total weight of the catch consisted of 66 percent carp (53 pounds per tow, primarily fish of the 1962-year class), 9.4 percent perch, 6.9 percent goldeye, 5.8 percent big-mouth buffalo, 3.0 percent burbot, and 6.4 percent other species. The largest single catch was 471.5 pounds of carp.

Catches of single tows ranged from 2.5 to 586.5 pounds. Since the primary object of the cruise was to delineate areas for successful trawling, no attempts were made to duplicate good catches in the same area or at the same time. Plans were to confine tows in a later cruise to the best trawling grounds to determine the probability of sustained high catches under intensive trawling in a given area.

Buffalofish (the most abundant species in Oahe Reservoir) were not often taken in the trawl probably because that species tends to remain in the upper stratum of deeper waters in the summer months. Since this may apply to other species as well, catch rates and character of the catches presumably may change considerably in the fall of the year.

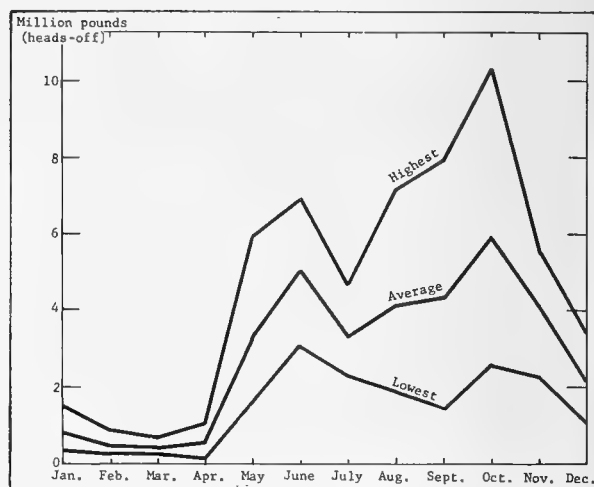
Note: See Commercial Fisheries Review, November 1965 p. 24.



## Louisiana

### LANDINGS AND FISHERY TRENDS, 1964:

Summary: Commercial landings of fish and shellfish in Louisiana during 1964 totaled 703.6 million pounds with an ex-vessel value of \$34.7 million--down 57.1 million pounds (8 percent) and \$511,000 (1 percent) from 1963. The major species (menhaden, shrimp, oysters, and crab) reflected light to moderate declines. In spite of the decline, Louisiana retained its number one position as the nation's leading State in volume of fisheries landings, and ranked fourth in value. Empire, Cameron, and Morgan City, La., ranked fourth, fifth, and eighth, respectively, among the leading U. S. ports in terms of quantity landed.



Louisiana shrimp landings by months, 5-year period 1960-64.

The 1964 Louisiana catch was taken by 10,408 fishermen operating 1,602 documented vessels (5 net tons and over) and 4,417 other boats. Louisiana manufacturing establishments in 1964 produced fishery products valued at over \$55 million at the wholesale level.

Shrimp: Louisiana shrimp landings in 1964 of 59.4 million pounds heads-on (38.1 million pounds heads-off weight) were 27 percent below the exceptionally good landings in 1963. However, the ex-vessel value of the 1964 shrimp landings (\$18.8 million) was down only 5 percent. White shrimp comprised 73 percent of the 1964 shrimp landings, and brown shrimp 27 percent. Sea bob and royal-red shrimp made up less than 1 percent of the catch. During the early months of 1964, a "wintering over" population of white shrimp yielded profitable catches to fishermen, which exceeded comparable catches in early 1963.

Louisiana Total Landings of Shrimp by Size (Heads-off) and Average Ex-Vessel Prices, 1964 and 1963

Size (heads-off per pound)	1964			1963		
	Landings (heads-off)		Average Price Per Pound	Landings (heads-off)		Average Price Per Pound
	Quantity	Percent of Total		Quantity	Percent of Total	
Number	1,000 Lbs.	%	Cents	1,000 Lbs.	%	Cents
Under 15	827.4	2.2	87.0	259.2	0.5	86.3
15 - 20	4,361.1	11.5	82.3	2,602.2	5.0	89.1
21 - 25	3,260.9	8.6	73.6	3,409.8	6.6	70.6
26 - 30	2,634.7	6.9	63.9	4,080.4	7.9	57.2
31 - 40	6,639.8	17.4	52.3	9,660.6	18.7	47.7
41 - 50	4,171.0	10.9	44.1	5,830.2	11.3	39.6
51 - 67	6,774.0	17.8	36.8	10,209.2	19.8	26.4
68 & Over	9,145.3	24.0	27.6	14,961.0	28.9	18.8
Sea Bobs	280.8	0.7	22.6	689.6	1.3	9.2
Total	38,095.0	100.0	49.3	51,702.2	100.0	38.3

Research conducted by the Louisiana Wild Life and Fisheries Commission indicated that the movements of postlarval brown shrimp into nursery areas in the early spring of 1964 greatly exceeded those of the 1963 banner year. Early hopes for a good brown shrimp crop dwindled, however, when later sampling revealed heavy losses of young brown shrimp from mid-March to mid-April. Below normal water temperatures coupled with low salinity in nursery areas during that period may have been major factors in the shrimp losses.

When the brown shrimp season opened on May 15, catches were disappointing. Catches taken from the inside waters were below normal and far lower than those of 1963. Landings continued at a slow pace until the inside waters closed to trawling on July 15. Large quantities of shrimp were trucked in from neighboring states during that period of low production.

In contrast with the spring brown shrimp failure, the 1964 fall white shrimp season was exceptional--the total ex-vessel value of that catch was at a record level and the quantity of the catch was surpassed only by the 1963 record harvest. Higher prices accounted for the greater value in 1964. The 1964 fall white shrimp season started slowly on August 17 with each succeeding month registering substantial increases through November. White shrimp of the larger sizes made up a greater portion of the 1964 landings than during the previous year. A strong demand resulted in sharp price increases, particularly for smaller-size shrimp.

**Oysters:** The oyster harvest in 1964 yielded 11.4 million pounds of meats with an ex-vessel value of nearly \$3 million. Compared with 1963, that was a decline of 1 percent in quantity and 20 percent in value. The de-

cline in value was due to a poor market for canned oysters coupled with a poor yield of meats. Canning plants used 47 percent of the 1964 Louisiana oyster harvest and produced 198,000 standard cases of canned oysters. The catch was taken by 1,560 fishermen operating 224 vessels (5 net tons and over) and 577 other boats.

**Crab:** Landings of hard blue crab in 1964 amounted to 5.7 million pounds with an ex-vessel value of \$379,000. Compared with the previous year, the 1964 landings were down 29 percent and were the lowest recorded since 1931. The reason for the continuing decline in abundance of blue crab is not known. Louisiana crab plants produced approximately 447,000 pounds of fresh-picked crab meat with a wholesale value of \$578,000 in 1964.

**Menhaden:** The 1964 Louisiana menhaden landings of 599.6 million pounds were down 5 percent from 1963. Hurricane "Hilda" was primarily responsible for the decline. Catches were exceptionally good until late September when "Hilda" approached the northern Gulf area disrupting fishing operations. After the hurricane passed, spotter planes were unable to locate large menhaden schools. As a result, about 6 weeks of fishing were lost. There were 50 vessels employing 900 fishermen engaged in the fishery. Menhaden products produced in Louisiana during 1964 amounted to 63,400 tons of meal, 9.9 million gallons of oil, and 4.5 million gallons of solubles. Plans have been announced for the construction of two new menhaden processing plants in Louisiana, one located at Dulac and the other at Abbeville.

**Edible Finfish:** Landings of finfish for human consumption in 1964 totaled 15.6 million pounds with an ex-vessel value of \$2.6 million--down 8 percent in quantity and 4 per-



cent in value from 1963. Fresh-water catfish, the leading species, with 1964 landings of 7.8 million pounds was valued ex-vessel at \$1.8 million--a drop of 10 percent in quantity but a gain of 2 percent in value from 1963. Among the salt-water items, the 1964 landings of reddrum (311,700 pounds), spotted sea trout (290,500 pounds), and red snapper (309,900 pounds)--species which ordinarily command the highest prices--were also well below the levels of the previous year. Landings of flounder and king whiting were higher in 1964.



## North Atlantic

### SOVIET FISHING ACTIVITY OFF COAST, OCTOBER 1965:

Soviet fishing activity on Georges Bank declined during October 1965. The decline was observed by the staff of the Resource Management Office, U. S. Bureau of Commercial Fisheries, Gloucester, Mass., which conducts weekly reconnaissance flights cooperatively with the U. S. Coast Guard. During the aerial observations in October, a total of 74 Soviet vessels were sighted and identified as 32 fish-factory stern trawlers, 6 "Skryplev-class" processing and refrigerated stern trawlers, 29 "Pioneer-class" side trawlers, 5 refrigerated fish transports, 1 base ship, and 1 fuel and water carrier. That compares to 112 vessels sighted in September 1965 and 47 vessels in October 1964.

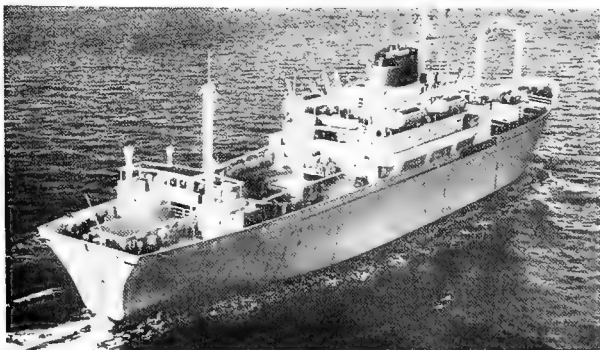


Fig. 1 - Soviet refrigerated fish-factory stern trawler of the "Skryplev" class.

Weekly estimates to mid-October 1965 showed that 50 to 60 Soviet vessels were operating in the Georges Bank area. However, by the month's end the number had decreased, temporarily at least, to less than ten. In 1964, Soviet fishing on Georges Bank declined

from October until late in November when Soviet stern trawlers and support vessels reappeared, though in fewer numbers.



Fig. 2 - Load of whiting and red hake on the deck of a Soviet stern trawler.

In October 1965, a number of Soviet vessels appeared to have shifted their operations from Georges Bank to eastern Nova Scotia areas. A temporary lag in fish production on Georges Bank may have prompted the move. The Soviets may also have reduced their fleet on Georges Bank in order to recondition vessels that have been operating in the Northwest Atlantic areas since late in the winter of 1965.



Fig. 3 - Soviet fish transport in North Atlantic.

Soviet fleet operations on Georges Bank during October 1965 were generally confined to the "Southwest Part" and "Southeast Part." Smaller groups and single vessels were widely scattered between the Cultivator Shoals and the "Northern Edge." The majority of vessels were actively engaged in fishing. Heavy to moderate catches of fish observed on decks and in their trawls appeared to contain both whiting and small haddock. Crews on both stern trawlers and large side trawlers continued to cull and dress fish on deck.



Such handling was not seen prior to 1965 and has raised questions as to the type of processing being done. The Soviets did not emphasize herring fishing during 1965. Previously, herring ranked either first or second in their total fish catch on Georges Bank.

In addition to Soviet activity, two Rumanian stern trawlers were sighted on Georges Bank.

Several Polish stern trawlers previously reported were not sighted during October.

Note: See Commercial Fisheries Review, Nov. 1965 p. 32.



## North Atlantic Fisheries Investigations

### LOBSTER AND SEA HERRING POPULATIONS AND LARVAE STUDIED:

M/V "Delaware" Cruise 65-11 (September 27-October 6, 1965): Lobster and herring investigations were conducted during this cruise in the North Atlantic Ocean (northern part of Georges Bank, Corsair, Veatches, and Hudson Canyons) by the U. S. Bureau of Commercial Fisheries research vessel Delaware. Objectives were to: (1) sample sea herring and lobster populations and obtain related environmental data, (2) obtain lobster blood samples, and (3) make plankton tows for herring and lobster larvae.

FISHING OPERATIONS: Herring: Six herring trawl sets were made at designated stations. The sets (1 hour each) made in waters of 35 to 40 fathoms yielded a total of 22 bushels (1,600 pounds). The herring obtained were from 24.7 to 36.1 centimeters (9.4 to 14.2 inches) long. The 1960 year-class was dominant in the catches, followed in percentage occurrence by the 1961 year-class. Examination of gonadal development showed that many of the herring had recently spawned. Herring that had not spawned were in a late stage of gonadal development. Species of fish obtained, other than herring, were scrod had-dock (52 bushels), butterfish (1 bushel), lemon sole (1 bushel), whiting (3 bushels), cod (1 bushel), hake (3 bushels), and cunner (1 bushel).

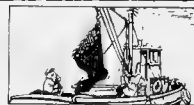
Lobster: A total of 9 trawl sets were made at the 2 lobster stations worked. The sets made in waters ranging from 55 to 150 fathoms yielded 78 lobsters (37 females and 41 males). Only one lobster was soft-shelled. All lobsters caught were from waters of eastern Veatches Canyon (55 to 70 fathoms). The

average weight of the lobsters was about  $1\frac{1}{2}$  pounds, and the range in weight was from  $\frac{1}{8}$  to 12 pounds. A total of 25 blood samples were obtained for analysis.

PLANKTON OPERATIONS: Herring: Eleven 1-meter net plankton tows lasting 15 minutes each (5 minutes at 10 meters, 5 minutes at 5 meters, and 5 minutes at the surface) were made during the cruise. A total of 390 yolk-sac larvae with an average length of 6.5 millimeters or about 0.2 inches was obtained at one station and 8 yolk-sac larvae of the same average length were obtained at another station. Larvae obtained at other stations measured 0.6 and 0.7 inches long. Lobster: Two 1-meter net plankton tows of 15 minutes each (at the surface) were made during the cruise, but no lobster larvae were obtained.

HYDROGRAPHIC OBSERVATIONS: Five sea-bed drifters and 5 drift bottles were released at hydrographic stations, and at each station bathythermograph (BT) casts were made, surface salinities collected, and weather observations recorded.

Note: See Commercial Fisheries Review, November 1965 p. 31.



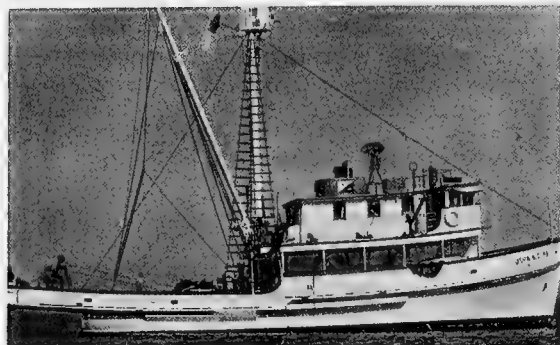
## North Pacific Fisheries Explorations and Gear Development

### HAKE POPULATION SURVEY CONTINUED:

M/V "John N. Cobb" Cruise 73 (August 30-October 1, 1965): This five-week pelagic exploratory cruise for Pacific hake (Merluccius productus) along the coast of California by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb was conducted cooperatively with the Bureau's biological and technological laboratories at Seattle, Wash., and with the California Department of Fish and Game.

To determine the geographic and bathymetric distribution of schools of hake along the California coast during the month of September was the primary objective. Secondary objectives were to: (1) obtain biological data on that species, and (2) obtain additional data relative to the catching efficiency of the Mark II "Cobb" pelagic trawl.

GEAR USED: The principal gear used was a standard Mark II "Cobb" pelagic trawl con-



Exploratory fishing vessel John N. Cobb.

structed of 3-inch mesh multifilament webbing. It was fished with the standard two aluminum hydrofoil-type otter boards on 60-fathom bridles. A 12-foot liner constructed of  $\frac{9}{16}$ -inch mesh webbing was placed in the cod end of the net to retain small fish. A high-resolution, low-frequency echo-sounder was used to locate the fish and a dual electrical depth-telemetering system was used to monitor the fishing depth of the net.

**METHODS OF OPERATION:** Onshore-off-shore echo-sounding transects were made at oblique angles to the coast between the 30- and 200-fathom contours. When hake were observed on the echo-sounder, closely spaced echo-sounding transects coupled with pelagic trawl hauls were made to determine the size of the schools. Length frequency, maturity, and sex ratio data were obtained from random samples of the catch. A bathythermograph (BT) cast was made after each haul, and plankton and bottom sediment samples were taken at selected localities.

**RESULTS:** The region surveyed with the echo-sounder extended along the California coast from its northern border to Santa Barbara Channel. Hake were found in two areas--off Fort Bragg and off Bodega Head. The sounding transect made off Fort Bragg, which is some 120 miles north of San Francisco, indicated the presence of a moderately large school of hake near the 70-fathom depth contour. The school was about 2 miles wide and 10 miles long. An hour haul made through the school yielded a catch of 21,000 pounds of hake. Two distinct size groups of hake were taken in the haul--a small group with a mode at 28 centimeters (11.0 inches), and a larger group with a mode at 44 centimeters (17.3 inches). Hake taken in past explorations off the Washington coast were repre-

sented by a single size group of modal length 54 centimeters (21.3 inches); those caught off Oregon were made up of two size groups with modal lengths of 44 and 51 centimeters. The only area other than California where small hake have been taken was in Puget Sound, Wash.

Sounding transects made off Bodega Head (about 40 miles north of San Francisco) indicated a number of small scattered hake schools were present along the 90- to 130-fathom contours. Hour hauls made through such schools generally yielded from 800 to 9,000 pounds of hake; one haul yielded 30,000 pounds. The largest haul occurred when the pelagic trawl was fished through several closely adjoining small schools. Hake caught off Bodega Head were similar in size to those taken off Fort Bragg.

Ten tons of hake were delivered for testing purposes to a reduction plant in San Francisco, Calif. Samples of the fish meal produced were to be analyzed by the Bureau's Seattle Technology Laboratory.

Note: See Commercial Fisheries Review, October 1965 p. 45.



## Oceanography

### COAST GUARD CUTTER "NORTHWIND" COMPLETES MAJOR STUDY IN SIBERIAN ARCTIC:

In early October 1965, the U. S. Coast Guard cutter Northwind completed an intensive oceanographic study in relatively unexplored Arctic waters north of the Soviet Union.

During her 2-months stay in the Arctic above the Soviet Union, the Northwind became the first United States oceanographic vessel to traverse the Kara Sea. Soviet destroyers stayed near the Northwind during much of the voyage, but did not interfere. The study was conducted in cooperation with the Intergovernmental Oceanographic Commission (IOC) of the United Nations. The information gathered by the Northwind will be made available to World Data Center A for Oceanography in Washington, D. C. World Data Center B is in Moscow. The two centers exchange oceanographic information.

During the Arctic cruise, the Northwind gathered information at 132 sampling stations on water temperature, salinity, dissolved oxygen, and nutrients. Bottom core

samples were taken at about half of the observation points. The core samples will be examined, among other things, for evidence of radioactivity.

The cruise also provided useful data on ocean currents in the far north region. Geological characteristics of the sea bottom in the area were determined by measuring shock waves set up by small underwater explosions.

The scientific party aboard the Northwind consisted of teams from the U. S. Naval Oceanographic Office, and the Geophysical and Polar Research Center of the University of Wisconsin.

After completing the Arctic cruise, the Northwind called at Oslo, Norway, and then sailed on October 10, 1965, for New York City and her home port of Seattle, Wash. The vessel had begun the cruise about  $3\frac{1}{2}$  months earlier when it sailed from New York City on June 27, 1965. Before entering the Arctic, the Northwind carried out a North Atlantic study (from the southern tip of Greenland to Iceland to Scotland) in order to monitor boundary conditions affecting the circulation between the North Atlantic Ocean and the Arctic Basin.

The cruise of the Northwind should make a major contribution to the world's knowledge of northern waters.

Note: See Commercial Fisheries Review, Sept. 1965 p. 40.

\* \* \* \* \*

#### "SEA LAB II" REPORT WILL BE FEATURED AT SYMPOSIUM IN WASHINGTON, D. C.:

"Man's Extension into the Sea" is the theme of a 2-day symposium to be held in Washington, D. C., January 11-12, 1966. Sponsored by the Navy and six professional societies, the meeting will feature a report on the Navy's Sea Lab II experiment.

The Sea Lab II experiment began Aug. 27, 1965, at an underwater site about one-half mile off the coast of La Jolla, Calif. During a 45-day period, 3 groups of 10 men lived and worked for 15 days each at a depth of 205 feet in a 57-foot long undersea habitat. The aquanaut teams were made up of both Navy divers and civilian scientists. Sea Lab II is the second phase of the Navy's "Man-in-the-Sea" program.

After a special 30-day stay in Sea Lab II, Astronaut-Aquanaut Scott Carpenter said the

second 2 weeks are the easiest because it takes some time to become conditioned and acclimated to the high-pressure living.

The symposium will cover many details of Sea Lab II such as aquanaut experiences, engineering problems, medical problems, training, logistics, communications, photography, scientific experiments, and instrumentation. Registration fee for the meeting is \$6.00, which includes admittance to all sessions and a bound copy of the proceedings.

For additional information about the meeting contact Charles W. Covey, Undersea Technology, 617 Lynn Building, 1111 N. 19th Street, Arlington, Va. 22209. Telephone (area code 703) 524-3136.

\* \* \* \* \*

#### CONFERENCE AND EXHIBIT TO BE HELD IN WASHINGTON, D. C., IN JUNE 1966:

The Marine Technology Society has announced plans for its 2nd Annual Conference and Exhibit to be held at the Sheraton-Park Hotel in Washington, D. C., June 27-29, 1966. Plans for the 1966 meeting were made after the success of the 1965 Ocean Science and Engineering Conference and Exhibit in Washington.

The theme of the 1966 Conference and Exhibit is "Exploiting The Ocean." The 3-day event will include over 70 presentations emphasizing both the opportunities and the problems on the marine frontier as industrial firms and Government agencies expand their programs to explore and use the vast resources of the world oceans.

The conference program will include papers on commercial fisheries, offshore drilling, chemical extraction from sea water, and ocean floor mineral recovery. Special attention will be given to the effect of State, Federal, and international maritime laws on all of those growing areas of oceanography.

Those interested in information on exhibit space at the meeting should contact Trade Associates, Inc., 5151 Wisconsin Ave. NW., Washington, D. C. 20016, Att.: Frank Masters.

For information on the conference and technical program write: Executive Secretary, Marine Technology Society, 1030 15th Street NW., Washington, D. C. 20005.

Note: See Commercial Fisheries Review, August 1965 p. 49.

\* \* \* \* \*

### STUDY OF UNMANNED BUOYS OFF MASSACHUSETTS:

The U. S. Bureau of Commercial Fisheries and the Coast Guard are cooperating in an experiment with unmanned oceanographic buoys off Cape Cod Light in Massachusetts waters. A section line of five orange-and-white buoys stretches out to sea for 3 miles. At depths of from 6 to 25 fathoms, sensitive instruments mounted in the buoys' concrete mooring blocks record temperatures and pressures existing on different types of ocean bottom. Those instruments are capable of recording data at hourly intervals for a continuous period of 400 days.

While the instruments are in operation, Bureau scientists will collect samples of marine animals in the vicinity of the buoys. From the analysis of the samples and of the data recorded by the instruments, they will learn more about the influence of water temperature on the distribution, abundance, and life history of a variety of marine life.



### Oysters

#### VIRGINIA SCIENTIST RECEIVES GRANT FOR MSX STUDIES:

The National Science Foundation has awarded a \$2,000 grant to finance continued research on MSX by the head of the biology department of Madison College, Harrisonburg, Va. The grant will allow the scientist to continue research during the academic year 1965/66 into the effect of MSX on respiration of oysters. He spent the summer of 1965 in a research program for college teachers sponsored by the Virginia Institute of Marine Science, where he measured the level of three enzymes and their relationship to respiration in oysters free of disease as opposed to those suffering from infection. He is interested in determining whether enzyme leakage is useful in diagnosing infections in oysters caused by MSX. Incidental to his primary study, he discovered that respiration in oysters practically ceases when the dinoflagellate bloom ("red tide") occurs in the York River. (Virginia Institute of Marine Science, October 20, 1965.)



### Transportation

#### AIRLINE CUTS RATES 40 PERCENT ON NORTHWEST FISHERY SHIPMENTS TO EASTERN POINTS:

United Air Lines has cut rates 40 percent on perishable shipments of fish and fishery products moving from the Pacific Northwest to major midwestern and eastern markets.

The airline supported its rate reduction by revising jet freighter flight schedules. The schedule revision provides for the addition of a nonstop jet freighter flight every Sunday between Seattle and New York and a jet freighter flight every weekday between Seattle and New York with stops at Chicago and Philadelphia. The rate cut became effective September 12, 1965. The revised flight schedules were to go into effect October 12.

Announcing the 40-percent rate cut in September 1965, United's manager of perishable sales described it as a "one-year experimental rate reduction" and said, "seafood will move from Seattle, Portland, and Vancouver, B. C., to New York at \$9 a hundredweight for a 2,000-pound shipment compared with the old rate of \$15.05. The rate to Chicago dropped from: \$11.10 a hundredweight to \$7.50."

Destination cities covered by the new rates include Boston, Baltimore, Cleveland, Detroit, Kansas City, Milwaukee, Philadelphia, Pittsburgh, and Washington, D. C., in addition to New York and Chicago. (Traffic World, September 18, 1965.)

Note: See report on plastic fish boxes particularly adapted to air shipment on pages 21 & 22 of this issue.



### U. S. Foreign Trade

#### IMPORTS OF CANNED TUNA UNDER QUOTA:

United States imports of tuna canned in brine during January 1-October 2, 1965, amounted to 35,332,411 pounds (about 1,682,500 standard cases), according to preliminary data compiled by the U. S. Bureau of Customs. That was an increase of 10.8 percent from the 31,894,583 pounds (about 1,518,800 standard cases) imported during January 1-October 3, 1964.

The quantity of tuna canned in brine which can be imported into the United States during the calendar year 1965 at the 12½-percent rate of duty is limited to 66,059,400 pounds (or about 3,145,685 standard cases of 48 7-oz.

cans). Any imports in excess of that quota will be dutiable at 25 percent ad valorem.

\* \* \* \* \*

### AIRBORNE IMPORTS OF FISHERY PRODUCTS, JANUARY-JUNE 1965:

Shrimp from Venezuela continued to be the main airborne fishery import into the United States during the second quarter of 1965. In January-June 1965, airborne imports of fishery products into the United States totaled 9.3 million pounds with a value of \$5.2 million. That was almost 2.5 times greater than the airborne fishery imports in the first half of 1964 when smaller quantities of shrimp were shipped by air from Venezuela.

U.S. 1/Airborne Imports of Fishery Products, April-June 1965 and January-June 1965 with Comparative Data						
Product and Origin 2/	Apr.-June 1965		Jan.-June 1965		Jan.-June 1964	
	Qty. 3/	Value 4/	Qty. 3/	Value 4/	Qty. 3/	Value 4/
	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000
<b>Fish:</b>						
All countries	251.1	250.0	481.7	480.2	264.4	87.1
<b>Shrimp:</b>						
Venezuela	3,171.8	1,601.5	7,718.3	3,926.5	2,162.1	984.1
Panama	222.8	145.8	592.4	370.9	512.1	309.4
Costa Rica	75.9	35.6	104.8	50.2	188.3	108.1
El Salvador	10.7	6.0	28.1	19.1	159.1	96.8
Other countries	0.4	0.6	54.5	30.4	83.3	47.5
<b>Total shrimp</b>	<b>3,481.6</b>	<b>1,789.5</b>	<b>8,498.1</b>	<b>4,397.1</b>	<b>3,104.9</b>	<b>1,545.9</b>
<b>Shellfish other than shrimp:</b>						
Canada	23.3	8.3	23.9	8.7	207.8	113.0
Mexico	0.8	0.7	1.2	1.0	9.0	4.8
British Honduras	21.7	5.5	76.2	57.5	82.8	50.4
Honduras	5.4	1.3	15.6	5.7	12.9	9.4
Nicaragua	33.4	18.0	104.1	112.0	50.5	40.0
Costa Rica	-	-	13.9	13.3	9.3	9.5
Jamaica	16.3	19.8	25.8	35.7	43.6	36.2
Other countries	13.6	11.5	109.2	77.2	39.0	15.2
<b>Total shellfish (except shrimp)</b>	<b>114.5</b>	<b>65.1</b>	<b>369.9</b>	<b>311.1</b>	<b>454.9</b>	<b>278.5</b>
<b>Grand total</b>	<b>3,847.2</b>	<b>2,104.6</b>	<b>9,349.7</b>	<b>5,188.4</b>	<b>3,824.2</b>	<b>1,911.5</b>

1/Imports into Puerto Rico from foreign countries are considered to be United States imports and are included. But United States trade with Puerto Rico and with United States possessions and trade between United States possessions are not included.

2/When the country of origin is not known, the country of shipment is shown.

3/Gross weight of shipments, including the weight of containers, wrappings, crates, and moisture content.

4/F.o.b. point of shipment. Does not include U.S. import duties, air freight, or insurance.

Note: These data are included in the overall import figures for total imports, i.e., those imports are not to be added to other import data published.

Source: United States Exports & Imports by Air, FY 1965, January through June 1965, U.S. Bureau of the Census.

The data as issued do not show the state of all products--fresh, frozen, or canned--but it is believed that the bulk of the airborne imports consists of fresh and frozen products.



## Washington

### TEST HERRING FISHERY OPENED OFF WHIDBEY ISLAND:

The opening of a test fishery for herring off the west coast of Whidbey Island in Puget Sound was announced October 8, 1965, by the

Washington State Department of Fisheries. The area opened is that portion of Puget Sound herring fishing Area No. 1, lying easterly or inside of a line from Partridge Point on Whidbey Island to Smith Island Light to West Point on Whidbey Island.

The fishery began October 11 and was scheduled to continue (with weekend closures) until a quota of 1,000 tons was reached. The abundance of herring in the West Beach area of Puget Sound is sufficiently large to justify such a catch, and the fish are in prime condition, fat, and very high in oil content. Such herring provide a superior product for reduction into oil and meal, as well as for processing into pickled herring, fish pellets, animal food, and bait.

The Washington State Department of Fisheries has released tagged herring off Whidbey Island and will assess tag recoveries to determine migration patterns. (Washington State Department of Fisheries, October 8, 1965.)



## Wholesale Prices

### EDIBLE FISH AND SHELLFISH, OCTOBER 1965:

From September to October 1965 prices were up for only several items (haddock and haddock filets, shrimp, and oysters) in the index. At 118.0 percent of the 1957-59 average, the overall wholesale price index for edible fishery products in October rose 1.5 percent from the previous month. Compared with the same month in 1964, the index this October was up 5.7 percent because prices were up substantially for large haddock and haddock filets, fresh shrimp, oysters, and canned salmon and jack mackerel.

In the subgroup for drawn, dressed, or whole finfish, prices from September to October were down 2.9 percent--all items were priced lower except ex-vessel large haddock. With the end of the seasonal North Pacific fisheries for halibut and salmon, the frozen form of those species at New York City were priced lower than the fresh product. October prices at New York City for Great Lakes round yellow pike dropped 35.8 percent from the Jewish Holiday prices of the previous month; prices at Chicago for Lake Superior fresh whitefish were down 8.7 percent. Large haddock prices at Boston were exceptionally high (up 27.4 percent from September to October and

Wholesale Average Prices and Indexes for Edible Fish and Shellfish, October 1965 with Comparisons								
Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1957-59=100)			
			Oct. 1965	Sept. 1965	Oct. 1965	Sept. 1965	Aug. 1965	Oct. 1964
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					118.0	116.2	114.3	111.6
Fresh & Frozen Fishery Products:					121.7	117.9	117.4	116.6
Drawn, Dressed, or Whole Fish:					131.9	135.8	133.4	133.4
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.23	.18	181.0	142.1	147.7	135.5
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.48	.51	142.0	150.8	149.4	164.1
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.84	.94	117.0	131.0	127.5	134.1
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.53	.58	78.3	85.8	94.8	79.8
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.61	.95	99.9	155.5	114.6	77.8
Processed, Fresh (Fish & Shellfish):					119.1	107.3	108.8	106.5
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.49	.48	119.0	116.6	99.6	97.1
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.87	.80	101.4	93.7	100.8	96.7
Oysters, shucked, standards	Norfolk	gal.	8.38	7.25	141.2	122.3	120.2	120.1
Processed, Frozen (Fish & Shellfish):					107.6	105.3	104.8	104.7
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.40	.40	100.1	100.1	98.8	91.2
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.40	.38	117.3	111.4	111.4	109.9
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.31	.31	107.0	108.7	108.7	103.4
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.87	.86	102.6	101.4	100.8	103.2
Canned Fishery Products:					113.0	113.7	109.4	103.1
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	27.00	27.00	117.7	117.7	106.8	94.8
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.56	11.56	102.6	102.6	102.6	102.6
Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	7.13	7.13	120.9	120.9	120.9	105.9
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	9.50	10.00	121.9	128.3	131.5	128.3

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

33.6 percent higher than in October 1964) because of light catches. As compared with the same month a year earlier, the subgroup index this October was down 1.1 percent; except for large haddock, prices were lower for all items.

October prices were higher by 11.0 percent from the previous month for all items in the fresh processed fish and shellfish subgroup. Prices for standard shucked oysters at Norfolk were up 15.5 percent because of limited production. At New York City, wholesale prices for South Atlantic fresh shrimp were substantially higher (up 7 cents a pound), and there was some increase in prices at Boston for small haddock fillets. The subgroup index this October was up 11.8 percent as against the same month in 1964. October 1965 prices were much higher for haddock fillets (up 22.6 percent) and for shucked oysters (up 17.6 percent) than in the same month a year earlier.

Higher prices from September to October for frozen haddock fillets (up 5.3 percent) at Boston and for frozen shrimp (up 1.2 percent)

at Chicago were responsible for a 2.2-percent rise in the subgroup index for frozen processed fish and shellfish. October prices for ocean perch fillets were about the same as in September while those for flounder fillets remained unchanged but were 9.8 percent higher than in October a year earlier. Compared with October 1964 the subgroup index this October was up 2.8 percent because of higher prices for all items.

Prices for canned fish were generally steady during October and mostly unchanged from the previous month. But lower prices from September to October for canned Maine sardines (down 5.0 percent) were responsible for a 0.6-percent drop in the subgroup index for canned fishery products. Canned Maine sardines were in better supply than a year earlier, with the 1965 pack as of the end of October topping the previous year's pack by nearly 50 percent. The subgroup index this October was 9.6 percent higher than in October 1964--prices for canned salmon were up 24.2 percent and for California jack mackerel up 14.2 percent. Canned tuna prices were the same as in October 1964.







# FOREIGN

## International

### FISH MEAL

#### PRODUCTION AND EXPORTS FOR SELECTED COUNTRIES, JANUARY-JULY 1965:

Member countries of the Fish Meal Exporters' Organization (FEO) account for about 90 percent of world exports of fish meal. The FEO countries are Chile, Angola, Iceland, Norway, Peru, and South Africa/South-West Africa.

Table 1 - Exports of Fish Meal by Member Countries of the FEO, Jan.-July 1965

Country	July		Jan.-July	
	1965	1964	1965	1964
. . . . .(1,000 Metric Tons). . . . .				
Chile . . . . .	1.0	14.4	51.3	87.0
Angola . . . . .	2.8	1.9	27.2	32.1
Iceland . . . . .	14.7	13.4	64.2	66.4
Norway . . . . .	24.5	12.0	117.3	121.0
Peru . . . . .	110.4	141.6	1,029.5	912.0
So. Africa (including S.-W. Africa) . . .	20.2	20.2	132.7	127.2
Total . . . . .	173.6	203.5	1,422.2	1,345.7

Table 2 - Production of Fish Meal by Member Countries of the FEO, Jan.-July 1965

Country	July		Jan.-July	
	1965	1964	1965	1964
. . . . .(1,000 Metric Tons). . . . .				
Chile . . . . .	2.2	6.3	47.1	97.3
Angola . . . . .	3.0	1.0	23.7	31.5
Iceland . . . . .	14.0	20.3	67.7	73.2
Norway . . . . .	46.2	15.0	189.8	114.9
Peru . . . . .	12.4	83.8	892.7	953.5
So. Africa (including S.-W. Africa) . . .	39.4	30.2	231.6	189.4
Total . . . . .	117.2	156.6	1,452.6	1,459.8

Peru accounted for about 72 percent of the 1.4 million metric tons of fish meal exported by FEO countries in January-July 1965.

\* \* \* \* \*

#### WORLD PRODUCTION, JULY 1965 WITH COMPARISONS:

World fish meal production in July 1965 was down 29 percent from the previous month due mainly to extremely poor production in Peru.

World Fish Meal Production by Countries, July 1965 with Comparisons

Country	July		Jan.-July	
	1965	1964	1965	1964
. . . . .(Metric Tons) . . . . .				
Canada . . . . .	7,547	8,778	44,059	30,712
Denmark . . . . .	10,233	11,703	65,446	53,553
France . . . . .	1,100	1,100	7,700	7,700
German Fed. Repub. . . . .	6,516	5,621	38,161	42,898
Netherlands . . . . .	518	500	3,375	4,000
Spain . . . . .	1/	1/	2/13,247	1/
Sweden . . . . .	113	164	4,482	5,830
United Kingdom . . . . .	7,588	6,985	48,161	47,268
United States . . . . .	43,955	40,975	123,790	128,637
Angola . . . . .	2,988	956	23,743	31,498
Iceland . . . . .	14,010	20,284	67,689	73,163
Norway . . . . .	46,153	15,020	189,789	114,855
Peru . . . . .	12,434	83,798	892,653	953,480
So. Afr. (including S.-W. Afr.) . . . . .	39,505	30,419	232,822	190,012
Belgium . . . . .	375	375	2,625	2,625
Chile . . . . .	2,228	6,318	47,142	97,298
Morocco . . . . .	1/	2,290	2/ 1,100	9,050
Total . . . . .	195,263	235,286	1,805,984	1,790,579

1/Data not available.

2/Data available only for January-May 1965.

Note: Japan does not report fish meal production to the International Association of Fish Meal Manufacturers at present.

World fish meal production in January-July 1965 was about the same as that in the first 7 months of 1964. Peru accounted for about 49 percent of total output in January-July 1965. Most of the principal countries producing fish meal submit data to the International Association of Fish Meal Manufacturers monthly (see table).

### FOOD AND AGRICULTURE ORGANIZATION

#### DESIGNING WITH COMPUTERS DISCUSSED AT THIRD INTERNATIONAL TECHNICAL MEETING ON FISHING VESSELS:

The use of electronic computers in designing fishing vessels was to be one of the major themes discussed at the Food and Agricul-



## International (Contd.):

ture Organization's (FAO) 3rd International Technical Meeting on Fishing Boats, which was scheduled to meet in Goteborg, Sweden, October, 23-29, 1965.

FAO, in cooperation with the British National Physical Laboratory at Teddington, has designed 40- to 85-foot fishing vessels with the help of a computer. From such designs, models of 40-, 55-, and 70-foot vessels have been built and tested extensively at the Teddington Laboratory. All three models performed as the computer said they would, according to the Chief of FAO's Fishing Boat Section. He said, "They did just what we designed them to do. We think this proves the computer system for designing small boats definitely works." A model of the fourth FAO computer-designed vessel, an 85-footer, was to be built and tested in Sweden. A paper on the computer-design program was prepared for presentation at the Goteborg meeting.

Some 300 participants from about 40 countries were expected at the meeting, and about 30 technical papers were to be presented. The program of the meeting was planned to emphasize the needs of the developing countries for smaller fishing craft--vessels under 100 gross tons--especially adaptable to their local waters. "What we hope to accomplish," said the Chief of FAO's Fishing Boat Section, "is to come up with ideas and recommendations that will enable us to set better standards for designing the smaller boats. The importance of these smaller craft, after all, is simply that they so greatly outnumber the larger boats in the world fisheries picture. They have an importance that cannot be overlooked if fishing is to progress in both the developing and developed nations." (Food and Agricultural Organization, Rome.)

Note: See Commercial Fisheries Review, Aug. 1965 p. 128, and May 1965 p. 50.

## LAW OF THE SEA

CONVENTION ON THE CONTINENTAL SHELF RATIFIED BY FRANCE:

On June 14, 1965, accession to the Convention on the Continental Shelf was deposited by France (with declarations and reservations). The Convention entered into force June 10, 1964. It is one of the Conventions formulated at the United Nations Conference on the Law of the Sea at Geneva on April 29, 1958.

Note: See Commercial Fisheries Review, May 1965 p. 55.

## NORDIC COUNTRIES

FISHING ORGANIZATIONS MEET TO DISCUSS FISHING LIMITS:

Nordic fishing industry organizations, which met in Oslo during September 1965, were reported nearer to agreement on appropriate fishing limits between Denmark, Norway, and Sweden. A new meeting was scheduled for October in Stockholm at which final agreement was expected, according to Danish reports. A modification in the Norwegian viewpoint on limits in the Kattegat and Skagerrak was expected to satisfy both Denmark and Sweden. Once the fishing industry organizations have reached agreement, representatives of the respective governments were expected to meet so that the new limits may be established without too much delay. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, September 22, 1965.)

Note: See Commercial Fisheries Review, September 1964 p. 54.

## NORTH SEA

SPECIAL FISHERY CHARTS PUBLISHED:

The Danish Hydrographic Office, in cooperation with similar institutions in Great Britain, the Netherlands, West Germany, Norway, and Sweden, has been preparing a series of 59 special fishery charts to cover the North Sea from south of the English Channel to north of Bergen, Norway. Sixteen of the 28 charts for which Denmark is responsible were to be made available in fall 1965. Fishermen may choose from three different versions of the charts according to the Decca chain used. The charts are half the size of the current navigating charts and overlap each other. Each chart covers 1 degree of latitude and 2 degrees of longitude. The Netherlands has published 6 charts, Norway and Great Britain 3 each, and West Germany 2. The uniform price in each country is equivalent to 10 Danish kroner (US\$1.45) per chart. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, September 22, 1965.)

## WEST EUROPEAN FISHERY CONFERENCE

MEETING IN THE HAGUE, SEPTEMBER 1965:

On September 28-29, 1965, a meeting was held in The Hague of the West European Fishery Conference (WEFC) comprising national fishery organizations of Belgium, Denmark, the United Kingdom, France, the German Federal Republic, Norway, Portugal, Spain, Sweden, and the Netherlands.

## International (Contd.):

Delegates to the meeting reviewed West European fisheries and considered some of the problems that might arise in the future, according to a report in the Netherlands Fishery Federation periodical De Visserijwereld, September 30, 1965.

Concern was expressed over the combined effect of the fishery development plans of various countries. It was felt that, in the aggregate, those plans could lead to excess fishing capacity. That in turn could lead to overfishing in the Atlantic and excess supplies or market gluts at European ports. Landings by non-European vessels in European ports might complicate the problem. The delegates agreed that such problems could not be solved at the WEFC meeting, so further study of the situation was recommended.

The Conference considered the question as to whether some coordination of the meetings of the Northeast Atlantic Fisheries Commission and the International Commission for the Northwest Atlantic Fisheries would be desirable. There was also a discussion of boxing fish at sea onboard fishing vessels. (United States Embassy, The Hague, October 12, 1965.)

## OCEANOGRAPHY

SOVIET GROUP VISITS U. S. UNDER SCIENTIFIC EXCHANGE PROGRAM:

Six oceanographers from the Soviet Union arrived in the United States in September 1965 for a four-week tour of American oceanographic installations as a part of the United States-Soviet technical and scientific exchange program. The Soviet scientists are returning a visit made by six American oceanographers to Russia in September-October 1964.

The Coast & Geodetic Survey of the U. S. Department of Commerce acted as their host during the scientists' stay in this country. After visiting the oceanographic World Data Center and the Coast & Geodetic Survey at Washington, D. C., they visited 10 oceanographic installations in New York, Massachusetts, Florida, Texas, Oregon, and Washington.

\* \* \* \* \*

JOINT SOVIET-NORWEGIAN EXPEDITION:

A joint Soviet-Norwegian oceanographic expedition started from Murmansk on Sep-

tember 1, 1965. Increased oceanographic cooperation between the two countries is expected to result. The object of the expedition was to coordinate methodology and instrumentation and to develop a joint system of deciphering data collected. The research chief of the State Marine Biological Station at Tromsø, Norway, and three other Norwegian oceanographers participated in the expedition.

With those aims achieved, the Soviet and Norwegian oceanographic vessels would be able to make separate and joint observations of value to both parties. During the September expedition, which was planned to last two weeks, the Soviet and Norwegian oceanographers were to make the same observations operating together in the same waters. On completion of the expedition, the scientists were to meet in Tromsø to work out a joint report on data collected.

Two Norwegian oceanographic vessels, the G. O. Sars and the Johan Hjort took part in the expedition. (United States Embassy, Oslo, August 1, 1965.)

U. S. -MEXICAN EXCHANGE OF SCIENTIFIC FISHERY DATA

As part of the observance of International Cooperation Year, the Bureau of Commercial Fisheries, U. S. Department of the Interior, has developed a program with Mexico, enabling the two nations to exchange scientific knowledge through an exchange of fishery biologists.

Two Mexican fishery biologists, one from Campeche and the other from Tampico, visited the Bureau's Biological Laboratory in Galveston, Tex., during fall 1965 to observe United States methods of shrimp research. Arrangement were also completed for other Mexican scientists to visit Bureau laboratories in La Jolla, Calif., and Seattle, Wash. The Bureau plans to send United States biologists to Mexico to study latest research procedures in that country.

The visiting scientists at the Galveston laboratory observed methods of identifying and sampling shrimp in the larval, postlarval, and juvenile stages in estuaries (areas where salt and fresh water meet). Those studies are vital in estimating and forecasting future shrimp crops. Shrimp is the most valuable resource taken by United States fishermen, and the shrimp industry ranks near the top of the Mexican economy.

## Angola

### FISHING INDUSTRY IN ANGOLA ATTRACTS INVESTMENTS FROM THE SOUTH AFRICA REPUBLIC:

A firm in the South Africa Republic has completed negotiations to enter the fishing industry at the Angolan port of Mocamedes. That represents the fourth investment in the Angolan fishing industry by firms in the South Africa Republic during the first 9 months of 1965. (United States Consulate, Luanda, September 24, 1965.)

Note: See Commercial Fisheries Review, March 1964 p. 40.



## Australia

### FROZEN EELS EXPORTED:

Eels fished by both Australian and New Zealand fishermen are being frozen and exported to European countries, including Great Britain, where they are a delicacy.

In Victoria, Australia, it is a new export industry. More than 10,000 pounds of eels, caught in lakes and streams in western Victoria during summer 1965, were sent to freezing plants where they were processed for export. The idea of the new enterprise started when it was learned there was a serious shortage of eels in Holland because of stream pollution.

A firm in Auckland, New Zealand, is exporting about 100 tons of eels a year to Europe. Another firm has received a large order valued at about US\$85,000 from a European buyer.

The manager of one of the New Zealand fishery export firms said retail prices for eels in Europe were quite high. His company exports silver-bellied long-finned eels weighing from  $\frac{1}{2}$  to 2 pounds each. They are deslimed and either block frozen or gutted and frozen packed in polythene bags, depending on how the customer wants them. (Fish Trades Gazette, July 24 and 31, 1965.)

\* \* \* \* \*

### NEW TUNA VESSEL "KARINA G" LAUNCHED:

The Karina G, launched in July 1965, is the largest tuna clipper yet built in Australia. It has a hold capacity for 100 short tons

of frozen tuna, and it carries bait tanks with a capacity of 22 tons. It is also the first fishing vessel constructed with the assistance of the Australian Government's shipbuilding subsidy. (Under that scheme, vessels of over 200 tons may be subsidized for the amount necessary to equate the price of the locally built vessel with the estimated cost of the vessel had it been purchased from the United Kingdom, or a maximum of 33.5 percent of the cost to build it in Australia, whichever is less.)

The Karina G was built for an experienced Australian tuna fishing company which plans to use the vessel for tuna fishing off New South Wales and South Australia and in the Tasman Sea.

The vessel will be capable of maintaining a speed of between 9.5 and 10 knots at sea in ordinary weather when fully loaded. Principal dimensions (approximate) are: length overall 92 feet, length between perpendiculars 79 feet, breadth moulded 26 feet, and depth moulded 13 feet. Accommodations are provided for a crew of 11.

The main diesel engine is a turbo-charged aftercooled marine propulsion engine having a continuous rating of 765 brake horsepower at 1,225 r.p.m., and driving a 5-bladed fixed-pitch propeller through a standard reverse reduction gear box with a ratio of 3.95:1.

The gearbox is equipped with a special trolling valve for low-speed operation of the propeller.

When running, the engine can be remotely controlled from the wheelhouse or the open fishing bridge but the engine must be started and stopped from the engineroom.

A refrigerated brine recirculating system using ammonia for cooling has been installed to freeze and refrigerate the tuna catch.

The vessel is fitted with radar, echo-sounder, videograph, automatic pilot, two-way radio, and a seawater temperature recorder.

The word "Karina" in the name of this vessel is an aboriginal word meaning wife, and it is the firm belief of the owners that they will be "wedded" to their new vessel. (Australian Fisheries Newsletter, September 1965.)





## Canada (Contd.):

An independent survey was carried out among lobster fishermen in two important lobster fishing districts covering parts of Prince Edward Island, New Brunswick, and Nova Scotia. The survey showed that over 90 percent of the fishermen who were interviewed favored some measure of trap limitation and some means of controlling the number of persons participating in the fishery. There also have been instances where fishermen in local areas have organized plans for voluntary control of the number of traps fished.

The need for some reduction in the fishing effort for lobsters in order to achieve a more profitable operation by lobster fishermen is recognized, the Minister continued. Steps are now being taken, he said, to intensify the economic and biological studies of the fishery as they relate to effective management of the resource. The studies are to be carried out jointly by the Department of Fisheries and the Fisheries Research Board of Canada. It is also proposed to introduce in 1966, experimental limitation of the lobster fishing effort in an area in the Maritimes to see how such measures, if feasible, might be adapted in the most equitable way. Such an experiment will be undertaken only after full discussion with the fishermen concerned. (Canadian Department of Fisheries, Ottawa, October 12, 1965.)

\* \* \* \* \*

## CANADIAN-BRITISH JOINT FISHERIES VENTURE IN NEWFOUNDLAND:

A joint fish processing operation in St. Johns, Newfoundland, was scheduled to be set up in the fall of 1965 by a large British trawling company and a Canadian firm. The venture is to be backed by grants and loans totaling over C\$1.25 million from the Canadian Federal and Provincial Governments.

A fish-salting plant for the joint firm should be completed in June 1966, and a freezing plant should be finished by the end of 1966.

Tentative plans call for the joint firm to order 6 trawlers from Great Britain at a total cost of C\$1.75 million.

Total annual production in the initial stages of the venture should be about 7,000 long tons

of processed fishery products. (Fishing News, London, September 3, 1965.)

(Editor's Note: The joint venture at St. Johns is the second British-Canadian fisheries operation in Newfoundland to be announced in 1965. Earlier in 1965, a large British frozen food company entered into partnership with a Newfoundland fisheries firm in order to help satisfy the growing demand for quality frozen fish in England.)

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## PROVINCE OF ONTARIO LANDINGS HIGHER IN FIRST HALF OF 1965:

Commercial fishery landings in Ontario's Great Lakes and inland waters in the first 6 months of 1965 were estimated at 18.4 million pounds with an ex-vessel value of C\$2.1 million--an increase of 13.7 percent in quantity and 11.6 percent in value from the same period a year earlier. Landings were up in Lake Ontario, Lake Erie, and the North Channel but were lower for other Great Lakes areas. Landings from inland lakes during the period were about the same as in 1964. Although landings in Lake St. Clair and Lake Superior were below 1964, the value was up slightly.

Two-thirds of the Province's landings came from Lake Erie which yielded 12.2 million pounds of fish valued at \$996,000. This was an increase of 19.4 percent in catch and 15 percent in value. Yellow perch landings increased slightly to 3.5 million pounds from 3.2 million pounds; smelt increased substantially to almost 5.7 million pounds from 4.7 million pounds. The greatest increase was in white bass--almost 1.6 million pounds from 769,000 pounds. Yellow pike continued to drop--137,000 pounds from 268,000 pounds.

The Northern Inland area was the second largest producer with a catch of almost 2.0 million pounds, a slight decrease from the previous year, but value increased by 27.8 percent to \$303,000. The most significant increase was in sturgeon and caviar production which almost trebled to 19,000 pounds from 7,000 pounds. This was the main factor in increasing the value of the catch for the area.

Lake Ontario showed the greatest overall increase--up 81.2 percent to 1.6 million pounds and value up 50.4 percent to \$203,000. Yellow perch increased to 226,000 pounds

## Canada (Contd.):

from 76,000 pounds and white perch to 391,000 pounds from 52,000 pounds. Those species accounted largely for the overall lake increase.

Lake Huron production dropped by 20 percent to 882,000 pounds valued at \$227,000. Chub, the main species produced, dropped 10 percent to 420,000 pounds. Yellow perch dropped considerably to 37,000 pounds from 240,000 pounds for the same period last year. Whitefish remained about the same at 128,000 pounds. Yellow pike was the only species of consequence to show an increase to 106,000 pounds from 96,000 pounds for the same period in 1964.

Lake St. Clair production dropped 12 percent to 606,000 pounds from 689,000 pounds; the value remained almost the same as in the previous year at \$189,000. Yellow perch production increased to 44,000 pounds from 16,000 pounds; white bass to 21,000 pounds from 19,000 pounds.

Lake Superior landings dropped to 490,000 pounds from 562,000 pounds while the value increased to \$120,000 from \$112,000. Yellow pike production increased by almost one-third to 153,000 pounds; whitefish dropped to 42,000 pounds from 47,000 pounds. (Net and Twine, Ontario Council of Commercial Fisheries, September 15, 1965.)

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### SALMON FISHING CLOSES EARLY IN FRASER RIVER:

Because of the light 1965 run of chum salmon, Canada closed the Fraser River to net salmon fishing on October 4, 1965, when the International Pacific Salmon Fisheries Commission relinquished control. The action had been forecast in May 1965 when the Canadian Department of Fisheries announced that the expected 1965 run of 680,000 chum salmon (or less) to the Fraser River would be below minimum spawning requirements.

The forecast was borne out when catches of chum salmon in Johnstone Strait up to September 11, 1965, totaled less than 15,000 fish. The Johnstone Strait was closed for the season on September 14, 1965.

Catches in the Gulf of Georgia and the Fraser River on September 29 also verified

the low level of chum salmon returns and indicated that the silver salmon run was probably one-half or less of that in 1964.

Following the closure of the Fraser River on October 4, test fishing indicated a buildup of silver salmon. Therefore, the Fraser was partially reopened to salmon fishing for a 24-hour period on October 12. With the completion of that period, the Canadian Minister of Fisheries announced that the river must remain closed to conserve chum salmon stocks. (Canadian Department of Fisheries, Vancouver, October 8, 1965.)

Note: See Commercial Fisheries Review, Nov. 1965 p. 43.



## Denmark

### JUTLAND OYSTER SEASON STARTS:

More than a million individual Danish oysters are expected to be marketed during the 1965/66 harvesting season which began in early fall 1965. The oysters are from the Limfjord beds in Jutland, and all of them will be eaten on the half-shell.

The oysters are bought in retail fish shops in "ready-to-serve" style and bring varying prices for each oyster depending on the size. Prices range downward from "A-largest" (not plentiful) at 38 U. S. cents each; "B-large" (not plentiful) 34 cents; "C" which is the size most in demand at 30 cents; and "D" the smallest, 23 cents.

"Ready to serve" means the fish retailer opens the oyster, loosens the oyster meat from the top and bottom shells, and then closes the shells before packing the oysters for the buyer. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, September 22, 1965.)

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### SEAL SKINS FROM GREENLAND AUCTIONED:

The Royal Greenland Trade Department held another of its regular auctions for Greenland seal skins on September 17, 1965, in Copenhagen, Denmark. The skins offered were of better than average quality, demand was good, and prices were up.

The entire offering of 27,372 seal skins was sold for a total of about US\$430,000. That

## Denmark (Contd.):

included 26,198 ringed (netsider) skins which were sold at prices ranging from \$2.60 to \$37.70. Sales of the remaining 1,174 Greenland skins (from harp, bladdernosed, and saddle seals) were made at prices ranging from \$5.20 to \$55.80. There were no offerings of skins from Alaska or Canada.

Prices were estimated to be 2.5 percent above the prices for skins of comparable quality sold at the February 1965 auction in Copenhagen. Prices for skins for coats advanced, and there was a general increase in prices for skins for footwear and other industrial purposes. As usual, German buyers were the best customers. Dutch, English, and French purchases also were significant.

The next sale of Greenland seal skins by the Royal Greenland Trade Department is expected to be held in February 1966, preceded by a week of inspection of offerings. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, September 24, 1965.)

Note: See Commercial Fisheries Review, June 1965 p. 52.



## Ecuador

## EXPORT OPPORTUNITY FOR FISHING VESSELS AND PROCESSING EQUIPMENT:

The development of the domestic tuna and groundfish industry is being emphasized by the Ecuadorean Government's National Economic Planning and Coordination Board (Junta Nacional de Planificacion y Coordinacion Economica). That agency has asked foreign suppliers to submit price quotations, specifications, and information on possible financing, payment terms, interest rates, guaranties, etc. on the following equipment which will be needed by the expanding Ecuadorean fishing industry:

Fishing Vessels: (1) Purse-seine tuna vessels with a daily freezing capacity of 20 to 30 metric tons and a storage capacity of 200 to 250 tons.

(2) Purse-seine tuna vessels with a daily freezing capacity of 50 to 60 tons and a storage capacity of 500 to 600 tons.

(3) Long-line fishing vessels for white fish (groundfish) with a capacity for 20 to 30 tons

of fish. Any quotations submitted for larger vessels should include adequate refrigerated-storage capacity.

Processing and Freezing Equipment: (1) Complete land-based tuna blast-freezing plant with daily freezing capacity of 70 tons and refrigerated-storage capacity for from 1,000 to 2,000 tons, complete with supplemental brine tank, compressors, tunnels, special doors, and maintenance shops.

(2) Complete land-based white fish freezing plant with daily freezing capacity of 10 tons to minus 20° C. (minus 4.0° F.) and refrigerated-storage capacity for 100 tons to minus 18° C. (minus 0.4° F.).

(3) Complete machinery and equipment for a tuna-canning plant with capacity to handle 30 tons of fish in each 8-hour shift, packing 4-lb., 1-lb., and 1½-lb. cans. The plant will not require its own can-making machinery as cans will be acquired locally.

(4) Fish meal machinery and equipment (10-ton-per-day capacity) to use waste products from the canning and freezing operations as well as anchoveta and other fish taken directly for the production of fish meal.

For additional information interested United States suppliers should write directly to the Junta Nacional de Planificacion y Coordinacion Economica, Avenida 10 de Agosto 608, Quito, Ecuador. (United States Embassy, Quito, September 22, 1965.)



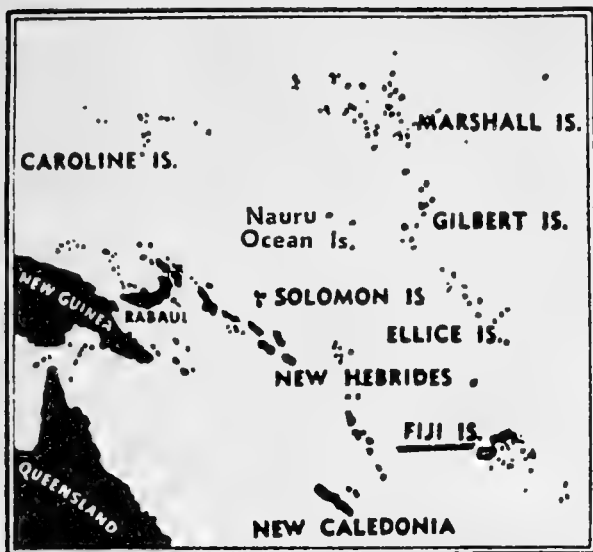
## Fiji Islands

## STATUS OF ANGLO-JAPANESE TUNA BASE:

The South Pacific Fishermen's Cooperative Association composed of members from Northern Prefectures in Japan is associated with the joint Anglo-Japanese tuna fishing enterprise at Levuka, Fiji Islands. The Association plans to have a 400-ton refrigerated carrier vessel transport fish, bait, and supplies between Fiji and Japan, making about 5 or 6 trips a year. A total of 16 tuna vessels, of which 15 (under 100 gross tons) are owned by Association members, operate from that base. It has been reported that the Association plans to employ Fijian



## Fiji Islands (Contd.):



natives to work on its vessels. (Katsuo-Maguro Tsushin, October 4, 1965.)

Note: See Commercial Fisheries Review, Dec. 1964 p. 92, and July 1964 p. 59.



## German Federal Republic

### INDUSTRY RECOMMENDATIONS FOR EEC FISHERIES POLICY:

Conflicting views on a fisheries policy for the European Common Market (EEC) have been presented by various branches of the German fishing industry. The opposing recommendations of the fish processors and vessel owners were presented in a recent paper to the German Federal Government prepared by the German Federal Markets Federation (Bundesmarktverband).

In general, the processors favor a liberal EEC fisheries policy allowing free fishing, free landings, and free marketing anywhere in the EEC by member countries. The vessel owners want protection for domestic landings by German fishermen.

The German vessel owners want the Government ex-vessel price supports to be continued as long as possible. (The vessel owners suggest differences in fishery price schedules of EEC countries should be main-

tained for domestic sales. For export sales, price adjustments could be made.) By contrast, the processors want minimum ex-vessel prices to be standardized throughout the EEC.

Landings of foreign-caught fish (such as Danish herring) at German ports is another point of difference between the two groups. The vessel owners want the price of such foreign landings sold in Germany to be subject to some regulation. The processors disagree, claiming that artificial prices for such supplies would make it difficult for them to compete with foreign processors.

The views of the processors are related to current supply patterns for herring. At one time German vessels landed large quantities of summer herring. But the decline of the heavy shoals of herring which formerly swarmed in the North Sea has limited the German season, and the home fleet now supplies less than a quarter of the herring requirements of German processors. Offers of year-round supplies of herring by Scandinavian countries have become of greater importance and those offered by Swedish and Danish fishermen are preferred because of their prime condition.

The German processors hope to receive imports free of duty from countries in the European Free Trade Association (EFTA) as well as from the EEC. Alternatively, the processors suggest Germany could lower the rate of duty on such imports when foreign supplies are needed. (Fishing News, London, September 10, 1965.)

Note: See Commercial Fisheries Review, Nov. 1965 p. 40, and Sept. 1965 p. 60.



## Greece

### FREEZER-TRAWLER FISHERY TRENDS, JANUARY-JUNE 1965:

The Greek fleet of Atlantic freezer trawlers landed 12,841 metric tons of frozen fish during January-June 1965 as compared to 9,650 tons in the same period of 1964.

The value of the frozen fish landings in the first half of 1965 was estimated to be 141.2 million drachmas (US\$4.7 million).

## Greece (Contd.):

The Greek fleet of Atlantic freezer trawlers had increased to 29 vessels by the middle of 1965. In addition the Soviet factory trawler Krylor was acquired by a Greek firm which planned to send it to North Atlantic fishing grounds in late summer 1965. Renamed Rea, the former Soviet vessel has a capacity of 3,170 gross tons. Its freezing capacity is 38 tons per 24-hour day, and its fishroom space is 1,370 cubic meters (1,792 cubic yards). It is equipped with a cannery and fish filleting unit. It also has a reduction plant with a daily capacity of 5 tons of fish meal and 2 tons of fish oil. Main dimensions of the vessel are length overall 85 meters (279 feet), breadth 14 meters (46 feet), depth moulded 10 meters (33 feet), main engine 2,000 horsepower, speed 13 knots, and accommodations for 102 persons. Built in 1959, the Rea is the first factoryship to be acquired by a Greek fishing firm. Initially the vessel is to be operated by a mixed Soviet and Greek crew.

Credit for further development of the Greek Atlantic fishing fleet may be extended by the Greek Industrial Development Bank (ETBA). The management of ETBA and the Fisheries Directorate of the Greek Ministry of Industry were reported to be studying the terms under which development loans could be extended to Greek fishery firms operating in the Atlantic. Modernization of vessels would be a major goal of such a project. (Alieia, July 1965.)

Note: See Commercial Fisheries Review, June 1965 p. 55; March 1965 p. 74; Nov. 1964 p. 85.



## Iceland

## EXPORT STOCKS OF PRINCIPAL FISHERY PRODUCTS, AUGUST 31, 1965:

As of August 31, 1965, Iceland's stocks of frozen groundfish (fillets) for export to the United States totaled 3,808 metric tons, a decline of 989 tons from the stocks on hand July 31, 1965. (United States Embassy Reykjavik, September 22, 1965.)

United States imports of frozen groundfish fillets from Iceland in the year 1964 totaled 17,812 metric tons of groundfish blocks and slabs, 4,669 metric tons of cod fillets, 2,791

Icelandic Export Stocks 1/ of Principal Fishery Products, August 31, 1965			
Item	Qty. Metric Tons	Value	
		Million Kr.	US\$ 1,000
Groundfish, frozen:			
for export to:			
U. S.	3,808	83.8	1,946.1
other countries	6,730	116.4	2,703.2
Stockfish	4,200	117.6	2,731.1
Herring, frozen	353	2.0	46.4
Industrial products:			
fish meal:			
herring	14,051	101.2	2,350.2
other fish	4,791	32.5	754.7
herring oil	22,218	184.4	4,282.4

1/Includes only stocks intended for export.  
Note: Icelandic kronur 43.06 equal US\$1.00.

metric tons of haddock fillets, and 548 metric tons of ocean perch fillets.

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## EXPORTS OF FISHERY PRODUCTS, JANUARY-JULY 1965:

During January-July 1965, there was an increase in exports of salted fish (dried), salted fish fillets, stockfish, frozen herring, canned fish, herring oil, herring meal, and ocean perch meal, as compared with the same pe-

Icelandic Fishery Exports, January-July 1965 with Comparisons						
Product	Jan.-July 1965			Jan.-July 1964		
	Qty.	Value f.o.b.		Qty.	Value f.o.b.	
	Metric Tons	1,000 Kr.	US\$ 1,000	Metric Tons	1,000 Kr.	US\$ 1,000
Salted fish, dried	1,953	38,412	891	676	17,452	405
Salted fish, uncured	21,944	368,643	8,553	22,504	348,908	8,095
Salted fish fillets	1,424	24,255	563	900	12,808	297
Wings, salted	812	11,180	259	1,130	14,270	331
Stockfish	6,216	180,448	4,186	5,136	139,348	3,233
Herring on ice	-	-	-	19	140	3
Other fish on ice	19,238	113,223	2,627	18,247	105,363	2,444
Herring, frozen	15,803	100,271	2,326	13,823	82,184	1,907
Other frozen fish, whole	2,473	25,723	597	1,635	15,846	368
Frozen fish fillets	29,895	680,695	15,792	35,048	699,037	16,218
Shrimp and lobster, frozen	311	37,249	864	653	58,646	1,361
Roes, frozen	1,458	22,816	529	1,140	18,783	436
Canned fish	392	18,140	421	178	9,658	224
Cod-liver oil	3,504	36,431	845	7,258	64,874	1,505
Lumpfish roes, salted	799	41,848	971	409	10,248	238
Other roes for food, salted	2,016	33,268	772	2,606	39,554	906
Roes for bait, salted	825	8,717	202	2,421	20,131	457
Herring, salted	10,547	114,232	2,650	15,212	154,806	3,591
Herring oil	41,749	351,772	8,161	14,048	109,887	2,549
Ocean perch oil	-	-	-	28	188	4
Whale oil	1,805	16,302	378	2,101	18,675	433
Fish meal	15,360	101,885	2,364	23,655	147,261	3,416
Herring meal	48,265	340,314	7,895	43,198	249,900	5,798
Ocean perch meal	1,181	7,857	182	631	5,682	85
Wastes of fish, frozen	4,868	18,912	439	2,127	7,675	178
Liver meal	484	3,439	80	355	2,349	54
Lobster and shrimp meal	44	219	5	87	346	8
Whale meal	414	2,475	57	930	5,165	120
Whale meat, frozen	1,730	15,560	361	1,242	9,876	229

Note: Values converted at rate of 1 krona equals 2.32 U.S. cents.

ried in 1964, according to the Icelandic periodical Hagtidindi, August 1965, Exports of frozen fish fillets, cod-liver oil, salted herring, whale oil, fish meal, and whale meal showed a considerable decrease in the first 7 months of 1965.

\* \* \* \* \*

## Iceland (Contd.):

LANDINGS, JANUARY-MAY 1965;  
FOREIGN TRADE AND FISHERIES TRENDS,  
JANUARY-JUNE 1965:

Summary: After the good year of 1964, in which Iceland's fishing industry benefitted from a record catch and high world prices, the prospects for 1965 do not seem as bright. The warnings by biologists that the Icelandic catch cannot increase indefinitely began to have more meaning by mid-1965. The catch for the first 5 months of 1965 was 12 percent below the same period in 1964. Fortunately, export prices were up: the average price for frozen fish fillets exported during the first half of 1965 was up almost 15 percent from January-June 1964; herring meal prices were up 22 percent; herring oil 8.5 percent; stockfish 5 percent; and salted fish 8.5 percent.



Fig. 1 - Two large Icelandic trawlers docked at Reykjavik.

Landings: The fishing industry got off to a delayed start after a 34-day labor dispute in early 1965 involving motorboat fishermen. Subsequently the entire herring fleet was idled for 6 days in June by a work stoppage. Neither dispute had a major effect on the catch. In the first 5 months of 1965, the Icelandic fisheries catch totaled 336,800 metric tons, or 12 percent less than the 382,800 tons landed in January-May 1964. A good herring catch in early 1965 prevented an even more severe decline. Herring accounted for 31 percent of the catch in January-May 1965 as compared to 21 percent in the first 5 months of 1964. (Preliminary reports show the herring catch through August 1965 running 6 percent over that in the same period of 1964.)

Processing: Paralleling the overall landings decline in January-May 1965 were a 17-percent drop in production of frozen fish (including fillets) and a 47-percent decline in output of stockfish.

Although the herring catch was up, production of salted and frozen herring in January-

May 1965 was only half that in the first 5 months of 1964. Reduction for meal and oil absorbed the increased herring landings. Unfortunately, herring for reduction only yields about one-third the foreign exchange value ordinarily received from salting and freezing.



Fig. 2 - Icelandic fish filleting, freezing, and packing plant in Reykjavik. Conveyors carry fish to upper floors for processing.

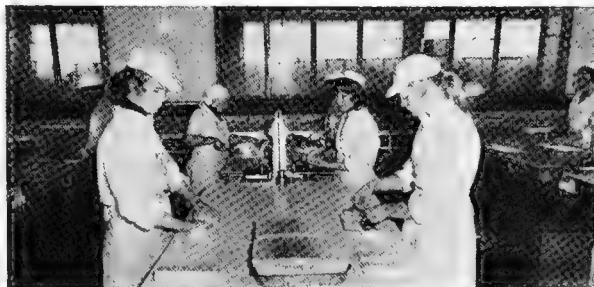


Fig. 3 - Trimming and packing fish fillets in an Icelandic processing plant.

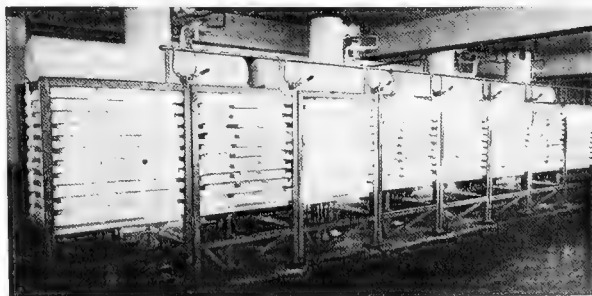


Fig. 4 - Plate freezer in an Icelandic fish-processing plant.

Labor: Negotiations were concluded in mid-1965 which resulted in a 16- to 19-percent increase in overall Icelandic labor costs (all industries). The labor shortage in the fishing industry continued unabated in the first half of 1965, with the industry partly dependent upon foreign workers (mainly Faroese) and temporary student workers. The scarcity and high costs of labor are creating a strong interest in labor-saving devices.

## Iceland (Contd.):

**Marketing Trends:** Iceland's fisheries are an export industry. Marketing is no problem with the present strong world demand and high prices for the Icelandic fishery products. However, a decline in demand could cause marketing problems for some of the less popular products such as salted herring. In late August 1965, negotiations broke down between Iceland and the Soviet Union for the renewal of a 3-year bilateral trade agreement due to expire at the end of 1965. The Soviets reportedly were asking for more frozen fillets (for which Iceland has more than adequate Western markets) and less frozen and salted herring.

**Foreign Trade: EXPORTS:** Iceland's exports of fishery products in January-June 1965 were valued at Kr. 2,347.9 million (US\$54.5 million) and accounted for 96 percent of total Icelandic exports during the period. Of the total exports (all products) in January-June 1965, the United Kingdom took about 22 percent; the United States 19 percent; Italy, the Soviet Union, and West Germany about 6 percent each; and Denmark, Nigeria, and Spain between 4 and 5 percent each; with the remainder going to over 20 other countries.

Value of Leading Icelandic Fishery Exports, January-June 1964-1965				
Product	January-June 1965		January-June 1964	
	Million Kronur	Million US\$	Million Kronur	Million US\$
Frozen fish fillets . .	649.1	15.1	617.3	14.3
Salted fish, uncured	325.3	7.5	298.7	6.9
Herring oil . . . . .	280.0	6.5	73.6	1.7
Herring meal . . . .	241.0	5.6	178.1	4.1
Stockfish . . . . .	159.9	3.7	125.2	2.9
Iced fish . . . . .	105.2	2.4	96.3	2.2
Herring, frozen . .	100.1	2.3	77.8	1.8
Other products . . .	487.3	11.4	567.2	13.2
Total . . . . .	2,347.9	54.5	2,034.2	47.1

Frozen fish fillets, the leading export commodity, accounted for 28 percent of the value of all fishery exports in January-June 1965. During that period, the average export price per metric ton for frozen fillets was Kr. 22,855 (\$531), up 15 percent from January-June 1964. The average export price per ton for frozen fillets exported to the United States in the first half of 1965 was Kr. 25,013 (\$581), an increase of 12 percent from the same period of 1964. In the first half of 1965, the frozen fillet exports were distributed as follows (comparisons for the first half of 1964

in parentheses): United States 66 percent (53 percent), United Kingdom 18 percent (10 percent), the Soviet Union 11 percent (32 percent), and other countries 5 percent (5 percent). The distribution of frozen fillet exports is an example of the declining importance to Iceland of trade with the Soviet Bloc and the growing importance of markets in the United States and the United Kingdom, as well as in other countries in the European Free Trade Association.

The United Kingdom is Iceland's primary trading partner. Total Icelandic exports to the United Kingdom increased in value from Kr. 329.0 million (\$7.6 million) in the first half of 1964 to Kr. 550.2 million (\$12.8 million) in January-June 1965. During the first half of 1965, the value of the main exports to Britain (comparable 1964 data in parentheses) were: herring oil Kr. 119.1 million (Kr. 5.0 million), herring meal Kr. 162.8 million (Kr. 91.7 million), and frozen fillets Kr. 113.8 million (Kr. 61.7 million).

The United States was Iceland's second most important export market. In the first half of 1965, frozen fish fillets accounted for 92 percent of the Icelandic fishery exports to the United States and were valued at Kr. 429.2 million (\$10.0 million), a gain of 31 percent over the same period of 1964. The United States took 66 percent of Iceland's frozen fillet exports in the first half of 1965.



Fig. 5 - Sacked stockfish for export ready to load aboard a freighter.

Italy ranked third among Iceland's markets in the first half of 1965, largely as the result of a seasonal, but significant increase of Kr. 72.0 million (\$1.7 million) in purchases of stockfish and salted fish.

The Soviet Union took only 6 percent of Iceland's exports during the first half of 1965 as compared with almost 12 percent in January-June 1964. The value of frozen fish fillet exports to the Soviet Union fell from Kr. 196.5 million in January-June 1964 to

## Iceland (Contd.):

Kr. 72.9 million in the first half of 1965. Shipments of salted herring to the Soviets were also down.

Icelandic exports to West Germany dropped from Kr. 206.3 million in the first half of 1964 to Kr. 144.0 million in January-June 1965, due mainly to a decline in fish meal exports and the almost complete absence of frozen and salted herring shipments.

**IMPORTS:** Iceland's imports in the first half of 1965 included seven fishing vessels from East Germany. Norway supplied transportation equipment (mainly fishing vessels) valued at Kr. 210.5 million (\$4.8 million).

**Import Opportunities:** Icelandic imports of vessels may decline in the future because much of the country's basic fleet modernization program has been completed. However, good export opportunities exist for labor-saving devices in Iceland. An example is the need in the herring fishery for pumps to move fish from net to vessel and then to transports or shore facilities. Weighing of reduction herring will be required by mid-1966, creating a considerable demand for weighing devices. Improved fishing and navigational devices of all kinds are being sought by the Icelandic fleet.

In April 1965, the Icelandic Parliament approved a bill reducing to 10 percent import tariffs on machinery used in the fishing industry, except that imported fishing equipment competitive with Icelandic domestic equipment is subject to a 15-percent duty.

Suppliers can usually reach the Icelandic market through Danish advertising channels since most foreign magazines imported by Iceland come from Denmark. (United States Embassy, Reykjavik, September 20, 1965.)

Notes: (1) In some cases, it is not clear whether summary data on Icelandic exports include products other than fishery products. However, the discrepancies resulting from such confusion should be small because fishery products account for 96 percent of Iceland's total exports.

(2) Icelandic kronur 43.06 equal US\$1.00.

(3) See *Commercial Fisheries Review*, Oct. 1965 pp. 74-75; Sept. 1965 p. 63; Aug. 1965 p. 72.

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LANDINGS BY PRINCIPAL SPECIES,  
JANUARY-MAY 1965:

Species	January-May	
	1965	1964
	..... (Metric Tons) .....	
Cod . . . . .	171,002	240,889
Haddock . . . . .	24,973	24,714
Saithe . . . . .	12,559	12,250
Ling . . . . .	2,472	2,826
Wolffish (catfish) . . . . .	6,052	6,858
Cusk . . . . .	1,098	2,719
Ocean perch . . . . .	9,221	8,630
Halibut . . . . .	233	331
Herring . . . . .	58,063	72,498
Capelin . . . . .	49,131	8,640
Shrimp . . . . .	408	89
Other . . . . .	1,623	2,331
Total . . . . .	336,835	382,775

Note: Except for herring which are landed round, all fish are drawn weight.

\* \* \* \* \*

UTILIZATION OF FISHERY LANDINGS,  
JANUARY-MAY 1965:

How Utilized	January-May	
	1965	1964
	..... (Metric Tons) .....	
<u>Herring and capelin</u> <sup>1/</sup> for:		
Oil and meal . . . . .	91,076	68,149
Freezing . . . . .	12,981	9,757
Salting . . . . .	3,137	3,231
<u>Groundfish</u> <sup>2/</sup> for:		
Fresh on ice . . . . .	18,468	17,235
Freezing and filleting . . . . .	99,139	119,738
Salting . . . . .	63,381	78,543
Stockfish (dried unsalted) . . . . .	41,257	78,035
Canning . . . . .	32	24
Oil and meal . . . . .	703	1,777
<u>Crustaceans</u> for:		
Freezing . . . . .	441	307
Canning . . . . .	123	36
Home consumption . . . . .	6,097	5,943
Total production . . . . .	336,835	382,775

<sup>1/</sup>Whole fish.

<sup>2/</sup>Drawn fish.

Source: Icelandic periodical *Haftidindi*, August 1965.



## Italy

FROZEN BLUEFIN TUNA  
REJECTED BY CANNERY:

According to a JETRO (Japan Export Trade Promotion Organization) representative in Italy, about 461 metric tons of frozen dressed bluefin tuna delivered to a cannery in Italy have been rejected as being unsuitable for canning. The bluefin were reported to be

## Italy (Contd.):

"mushy" when cooked. (Note: The article described the condition of the cooked fish as being like Japanese bean curd cake, which is soft, watery, and crumbles easily.) The fish were said to be taken off the coast of Florida.

As a result of this development, it was reported that an additional 130 tons of frozen bluefin delivered to Venice were rejected on grounds that the fish were taken from the same locality. The fish were not even unloaded from the carrier vessel and were shipped to Japan via Las Palmas. All the fish were reported rich in fat in the belly area and excellent for "sashimi" (sliced raw fish eaten by Japanese with soy sauce) but not suitable for canning. (Suisan Keizai Shimbun, September 17, 1965.)

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#### LANDINGS, IMPORTS, AND FISHERY TRENDS, 1964:

Italian fishermen landed 223,370 metric tons of fish and shellfish in 1964 as compared with 228,700 tons in 1963. The 1964 landings included 2,552 tons of tuna, 61,813 tons of sardine and mackerel, 107,324 tons of other fish, and 51,681 tons of shellfish.



Fig. 1 - Shooting the trawl aboard an Italian freezer trawler operating off the African coast.

The Italian fishing fleet in 1964 was composed of 29,730 vessels (194,251 gross tons) with a total value of US\$105.9 million. Over 126,000 persons are employed in the fleet.

Italy imported 197,109 tons of fishery products in 1964--mostly fresh and frozen products from Denmark, Japan, Norway,

France, and Germany. Over 229,000 tons of fishery products were imported in the previous year.

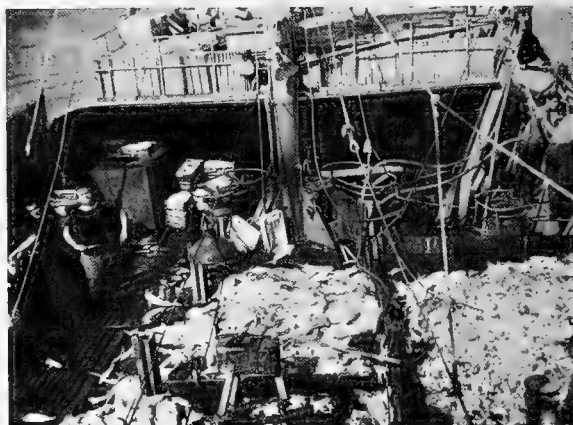


Fig. 2 - Deck of an Italian freezer trawler fishing off the African coast.

Per capita annual consumption of fishery products in Italy is about 16 pounds, mostly fresh and frozen fish. Per capita consumption of canned fish is slightly more than fish smoked, salted, or dried. Consumption of canned fish has risen significantly in recent years while consumption of other types of fishery products has remained static.

Italy exports very small quantities of fresh, frozen, and canned fish. Her principal fishery export is canned tuna to the United States. (La Pesca Italiana, August 19, 1965, and other sources.)

Note: See Commercial Fisheries Review, October 1965 p. 75.



## Japan

### EXPORT VALIDATIONS OF FRESH AND FROZEN TUNA AND TUNA LOINS BY COUNTRY, APRIL-AUGUST 1965:

Japan's export validations of frozen tuna and cooked frozen tuna loins to the U. S. and Canada in August 1965 were down 9.4 percent from the same month in 1964. Albacore and yellowfin accounted for 91.6 percent of that month's export approvals for those countries. Included were 1,400 short tons from Japanese transshipment bases including American Samoa.

For the 5 months April-August 1965, frozen tuna export validations for the United States and Canada were up 4.7 percent from



## Japan (Contd.):

Japan's Export Validations of Fresh and Frozen Tuna and Tuna Loins by Country of Destination, April-August 1965

Item	To U. S. and Canada			To Other Countries			Total	
	July	Aug.	April-Aug.	July	Aug.	April-Aug.	Aug.	April-Aug.
	..... (Short Tons) .....			..... (Metric Tons) .....			..... (Metric Tons) .....	
Albacore, round .....	9,051	7,264	32,218	139	1,228	3,756	7,818	32,983
Yellowfin:								
Round .....	352	856	2,816	27	10	36	342	1,372
Gilled & gutted:								
20/100 lbs. ....	2,712	3,747	14,606	97	85	1,607	3,484	14,857
100 lbs. up .....	333	483	1,633	-	-	-	438	1,482
Dressed with tail .....	626	67	3,675	1,435	1,344	12,742	1,405	16,075
Fillets .....	-	-	3	-	-	4	-	6
Total .....	4,023	5,153	22,733	1,559	1,439	14,389	5,669	33,792
Big-eyed:								
Dressed .....	66	142	440	852	476	4,599	475	4,765
Other .....	23	27	44	1	26	378	51	419
Total .....	89	169	484	853	502	4,977	526	5,184
Skipjack .....	648	426	4,060	43	473	517	859	4,200
Bluefin:								
Dressed .....	-	-	-	470	529	2,468	529	2,469
Fillets .....	-	-	-	362	180	872	180	871
Total .....	-	-	-	832	709	3,340	709	3,340
Loins:								
Albacore .....	432	305	1,202	-	9	9	286	1,099
Yellowfin .....	150	240	1,025	-	19	19	237	949
Total .....	582	545	2,227	-	28	28	523	2,048
Grand total 1965 .....	14,393	13,557	61,722	3,426	4,379	27,007	16,104	81,547
Grand total 1964 .....	16,825	14,964	58,950	4,573	4,672	24,000	18,248	77,479

the same period in 1964. Included for those countries during that period were 3,513 tons from Japanese transshipment bases. (Fisheries Attache, United States Embassy, Tokyo, October 5, 1965.)

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#### CANNED TUNA IN BRINE STOCKS AND EXPORTS TO THE UNITED STATES AS OF SEPTEMBER 6, 1965:

Japanese export sales of canned tuna in brine to the United States during the current business year (December 1964-November 1965) totaled only 1,411,000 cases as of September 6, 1965, according to data released by the Tokyo Canned Tuna Sales Company at the Japan Tuna Packers Association's executive meeting September 6, 1965. Of those sales, 1,249,000 cases had been shipped and 162,000 cases remained to be shipped. The sales included 1,156,000 cases of whitemeat and 255,000 cases of lightmeat tuna.

Stocks of canned tuna in brine held by the Tokyo Canned Tuna Sales Company as of September 6, 1965, totaled 1,592,000 cases, of which 1,535,000 cases were whitemeat and 57,000 cases were lightmeat. The whitemeat

tuna stocks included 302,000 cases classified as "B-grade." (Suisan Tsushin, September 17, 1965.)

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#### CANNED TUNA EXPORTERS REQUEST EXTENSION OF EXPORT AGREEMENT:

The Japan Canned Foods Exporters Association on September 22, 1965, submitted to the Japan Tuna Packers Association a request to extend to March 31, 1966, the existing Exporters Agreement, which ended November 30, 1965. The Exporters Agreement (which establishes export quotas and regulates trading activities) normally covers a one-year period, extending from December 1 to November 30 of the following year. However, the existing Agreement (1965) was not concluded until spring 1965 due to the inability of the two associations to come to terms after the expiration of the old agreement. The Exporters Association stated in its request that it hoped to see the present Agreement be made effective for one full year and, at the same time, to allow for the extension period of four months and revise upward the export quota of canned tuna in brine for sale to the United States to 2.5 million cases (from the present



Japan (Contd.):

2,210,000 cases). (Suisan Tsushin, September 28, 1965.)

Note: See Commercial Fisheries Review, November 1965 p. 63.

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#### TUNA FISHING AND PRICE TRENDS AS OF SEPTEMBER 1965:

Increasing numbers of Japanese tuna long-line vessels in the Atlantic Ocean were returning to Japan following the end of the albacore season in late August 1965. Many of the vessels did not plan on immediately returning to the Atlantic but intended to make 1 or 2 trips out of Japan and, in the meanwhile, look the general situation over.

As of early October 1965, the main albacore fishing activity was in the Indian Ocean near Madagascar. Vessels operating in that area were averaging catches from 3-5 metric tons a day.

As a result of the declining supply this past September of Japanese-caught albacore from the Atlantic Ocean and the poor United States albacore season in the Pacific off California, the price of frozen round albacore exported to the United States from Japan proper about that time recovered to \$375 a short ton c. & f. (about \$330 a ton f.o.b.). The ex-vessel price of ship-frozen albacore landed in Japan proper was about 127 yen a kilogram (US\$320 a short ton) for large fish and about 115 yen a kilogram (\$290 a short ton) for small and medium albacore.

Most of the clipper-caught frozen yellowfin landed in Japan during September were from the Coral Sea area. Due to their excellent quality and color, those fish were diverted to the fresh fish trade and were reported to have brought the phenomenal price of 280 yen a kilogram (US\$705 a short ton). (Suisan Tsushin, October 1, 1965.)

Note: See Commercial Fisheries Review, October 1965 p. 78.

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#### TUNA FEDERATION TO PROMOTE CANNED ALBACORE IN OIL:

The Japan National Federation of Tuna Fishermen's Cooperative Associations (NIKKATSUREN) at the directors' meeting held September 28, 1965, to discuss albacore tuna price stabilization measures, agreed to launch a sales campaign to promote the con-

sumption of canned albacore tuna in oil in Japan. This program, launched November 1, 1965, is scheduled to be continued for a period of three years. Promotional activities are to be financed with funds obtained by assessing tuna producers 80 yen per kilogram (US\$2.02 a short ton) for frozen albacore and 70 yen per kilogram (US\$1.75 a short ton) for iced albacore unloaded in Japanese ports. Solid pack albacore will be used in the promotional campaign. Sales target for the first year will be the equivalent of 150,000 cases (48 7-oz. cans), quantity to be progressively increased in succeeding years. (Suisancho Nippo, & Katsuo-Maguro Tsushin, September 29, 1965.)

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#### GOVERNMENT AND INDUSTRY HOLD FOURTH TUNA MEETING:

The Japanese Government and tuna industry leaders have been holding a series of meetings to develop measures to help the long-depressed tuna fishing industry. The fourth meeting was held in Tokyo, September 24, 1965. Whereas the first three meetings were devoted to discussions and analyses of conditions facing the industry (such as the condition of tuna resources, management and supply problems), the fourth meeting dealt with a summary review of the earlier meetings (prepared by the Fisheries Agency). A consensus of views was arrived at with respect to a general awareness of the problems facing the industry and the direction in which measures should be developed to overcome those problems.

Also at the September 24 meeting, the Japan National Federation of Tuna Fishermen's Cooperative Associations (NIKKATSUREN) presented the details of its plan to establish a corporation to stabilize operation and management of the tuna fleet. According to NIKKATSUREN, the corporation would systematically carry out a tuna fleet reduction program by disposing of fishery enterprises considered hopeless of financial recovery and by assisting others in the tuna fishery in modernizing their vessels and rationalizing their management. Operating funds for the organization would be obtained from such sources as government subsidy, assessments to industry members, government and commercial loans, and flotation of loans. Some activities that the proposed organization (to be established for 20 years) would carry out are:

## Japan (Contd.):

1. Fleet Reduction: Purchase licensed vessels withdrawing from the fishery and pay separation allowances to individuals affected by this reduction. Funds required for this program were estimated at:

(a) vessel purchase: 6,800 million yen (US\$18.9 million) for 85 vessels each year, and 20,400 million yen (\$56.7 million) for 255 vessels in three years averaging 80 million yen or \$222,000 per 200-ton vessel); (b) separation pay: 110.5 million yen (\$307,000) for 2,210 persons each year, and 331.5 million yen (\$921,000) for 6,630 persons in three years (averaging 50,000 yen or \$139 per person for a vessel with a complement of 26).

2. Loans for Modernization of Vessel and Facilities: The corporation would finance up to 50 percent of the total cost of installing labor-saving devices and of facilities which serve to improve the distribution system. Loans, reportedly, would be granted interest free, repayable in 10 years with one-year deferment. Funds required for these programs were estimated at:

(a) vessel modernization: 4,500 million yen (\$12.5 million) for 90 vessels each year, and 45,000 million yen (\$125 million) for 900 vessels in 10 years (averaging 100 million yen or \$278,000 for a 250-ton vessel); (b) facilities improvement: 200 million yen (\$556,000) for two facilities each year, and 1,000 million yen (\$2.8 million) for 10 facilities in five years; (c) vessel accommodation improvement: 440 million yen (\$1.2 million) for 220 vessels each year, and 1,320 million yen (\$3.6 million) for 660 vessels in three years.

The organization would also extend long-term loans to enterprises requiring working capital or rehabilitation funds. (Suisan Tsushin, September 25, 1965.)

Note: See Commercial Fisheries Review, October 1965 p. 80.

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#### TUNA FEDERATION DISCUSSES MEASURES TO STABILIZE INDUSTRY:

The Japan National Federation of Tuna Fishermen's Cooperative Associations (NIKKATSUREN), September 14, 1965, held a policy committee to discuss measures for

stabilizing the tuna industry. Among matters discussed at that meeting were albacore price stabilization and establishment of a corporation to carry out the tuna fleet reduction plan.

With regard to albacore price stabilization measures, the committee decided to submit this matter to the general membership on September 28 for formal action after first conducting further studies on albacore production to determine the quantity available for sale on the Japanese domestic market.

Concerning the proposed establishment of a corporation to carry out the tuna fleet reduction plan, the committee was unable to agree on how large the reduction should be, how this would affect the related industries, and how to assess the market value of "fishing rights" which the corporation would purchase from depressed vessel owners withdrawing from the tuna fishery. (Note: In Japan fishing licenses, or so-called "fishing rights," are transferable. Depending on fishing and fish market conditions, premiums paid for "fishing rights" fluctuate widely. In July this year, tuna "fishing rights" were reported selling for 130,000-140,000 yen (US\$361-389) a gross vessel ton as compared to over \$1,000 a vessel ton several years ago.) It was estimated that 10 billion yen (US\$27.8 million), which NIKKATSUREN hopes to borrow from the Government, would be required to carry out the program.

The Committee also approved at the September 14 meeting the admission into NIKKATSUREN of the Ryukyu Distant-Water Fishery Cooperative Association as an associate member. The Ryukyuan cooperative, which manages 29 fishing vessels aggregating 6,000 gross tons, was reported seeking membership in NIKKATSUREN in order to obtain information on Japanese labor problems, stabilize operation of Ryukyuan vessel owners engaged in the Atlantic fishery, and to be eligible for participation in Japan's high-seas vessel refueling and supply program. (Suisan Tsushin, September 16, 1965.)

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#### ASIAN TUNA CONFERENCE BEING CONSIDERED:

The Japanese Fisheries Agency and the National Federation of Tuna Fishermen's Cooperative Associations (NIKKATSUREN) are considering a plan to sponsor an "Asian Tuna

## Japan (Contd.):

Conference of Scientists and Technical Personnel" in 1966. Countries to be invited to the conference are the Republic of Korea (ROK), Formosa, and the Ryukyu Islands, all of which are rapidly building up their tuna fleets and are expected to enter into wide-spread competition with Japan in the future. Objective of the conference is to lay the basis for "adjustments before the fact" and to promote mutual cooperation.

According to the Fisheries Agency, the ROK already has 21 tuna vessels (a total of 2,500 gross tons) in operation and is presently planning to increase her fleet by 150 vessels (a total of 30,000 tons). Further, the ROK plans to construct an additional 100 vessels with aid funds provided by Japan.

Formosa is reported to presently have in operation 250 tuna vessels (a total of 12,800 gross tons) and plans to construct 16 tuna vessels (a total of 7,000 gross tons) with funds borrowed from the World Bank.

The Ryukyu Islands has a fleet of 25 large tuna vessels (a total of 5,500 tons) which were exported to that country by Japan since 1960. With assistance from the United States, the Ryukyu Islands is reported to be planning on increasing her tuna fleet to 12,000 tons by 1971.

The Fisheries Agency is said to be concerned that the rapid advancement of the tuna fisheries in those countries will not only result in those countries entering into competition with Japan on the fishing grounds and for the same overseas market but may well lead to contributing to the decline in tuna resources. Reportedly, the Agency hopes to sponsor the tuna conference for the purpose of preventing such a development and to utilize the conference for exchanging information between scientists and discussing problems relating to technical assistance, thereby laying the groundwork for future cooperation.

It is reported that the Agency is emphasizing the following points concerning the need for holding such a conference:

1. The Japanese tuna fishery is a licensed fishery and Japan is presently restricting the expansion of that fishery. Particularly in recent years, the tuna catch hook rate has declined and there are signs that the resources

are in danger. Therefore, it is necessary that every country give consideration to the condition of the resources.

2. Each country is separately supplying fish to foreign tuna markets, of which the United States market is the largest. An increase in exports may well create disorder in export prices.

3. Each country is planning on expanding its tuna fishery by using cheap labor, whereas Japan is faced with a labor shortage. It may be possible to establish a mutually profitable relationship whereby Japan could import fishing labor and provide training in fishing techniques.

The Fisheries Agency is expected to formally communicate with the three countries on holding the tuna conference as soon as it completes internal arrangements. (Nihon Suisan Shimbun, August 27, 1965.)

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#### JAPANESE TUNA RESEARCH VESSEL SURVEYS ATLANTIC:

The Japanese Fisheries Agency's research vessel Shoyo Maru (604 gross tons) departed Tokyo, September 25, 1965, on an extended cruise to survey the Atlantic Ocean tuna resources. The vessel is scheduled to return to Japan, March 15, 1966. (Suisancho Nippo, September 25, 1965.)

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#### GOVERNMENT VIEWS ON 12-MILE FISHING LIMIT:

Tentative proposals to establish a 12-mile fishing limit in certain areas of southwest Japan were discussed in an article in the Japanese periodical Nihon Keizai, September 26, 1965. According to the article, the action was planned in connection with the proposed Japanese-Korean Fisheries Agreement. However, it could have wider implications since it would be at least a partial change in long-standing Japanese policy. (Fisheries Attache, United States Embassy, Tokyo, October 1, 1965.)

In order to clarify the situation, the Japanese Fishery Agency on October 1, 1965, made an announcement (reported in Suisan Keizai Shimbun, October 4, 1965) which stated that: (1) at the present time Japan does not intend to establish an exclusive 12-mile fishing limit along the entire Japanese coast; (2) the 12-

## Japan (Contd.):

mile fishing zone to be established around Tsushima (a Japanese island situated in the Korea Strait) in accordance with the proposed Japan-Republic of Korea Fisheries Agreement will not affect countries other than Korea; (3) there are moves by various countries to establish a 12-mile fishing limit, but any unilaterally established fishing limit will have no binding power upon Japan; and (4) fishing limits established by agreement between different countries apply only to the contracting powers.

To amplify the Fishery Agency announcement, the article in Suisan Keizai Shimbun, summarized Japanese views on extended fishing limits as follows:

(1) At the Second Law of the Sea Conference convened in Geneva in 1960, a proposal was made concerning 12-mile fishing limits. The Japanese position is that the proposal was not intended to codify existing international custom, but to harmonize the claims of various countries concerning the breadth of territorial waters and to achieve international agreement. Therefore, it was not an attempt to recognize any right to unilaterally establish a 12-mile fishing limit. Moreover, since the proposal was defeated, the countries that had voted for it must conform as before to international law.

(2) Since 1960, some countries have concluded bilateral or multilateral fishery agreements with the aim of establishing 12-mile fishing limits. In those cases, Japan considers that the agreements were concluded solely to enable the contracting countries to solve problems affecting their fishery interests, which the Second Law of the Sea Conference failed to resolve. Therefore, the fishing zones established under such agreements were not for the purpose of unilaterally asserting the rights of the coastal countries, but were special arrangements developed on the basis of mutual agreement. Thus, their establishment affects only the contracting countries, and generally has no effect on other countries. Any fishing zone established unilaterally will not be recognized as having binding power on Japan.

(3) With regard to the proposed Japan-Republic of Korea Fisheries Agreement, the two countries, based on the special relationship existing between them, have mutually

agreed to recognize a right to establish special fishing zones. Thus, restrictions on fishing zones established by Japan are not applicable to any country other than Korea.

Note: See Commercial Fisheries Review, March 1965 p. 83, and December 1964 p. 104.

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#### CANNED SALMON EXPORT STOCKS, PRICES, AND MARKET TRENDS, SEPTEMBER 1965:

Following a good fishing season for both red and pink salmon, Japanese canned salmon export sales were reported moving well in September 1965. Compared with 1964, Japanese export prices in September 1965 were up for canned pink salmon, but down somewhat for red salmon (influenced by the supply situation in North America).

Since the start of the current marketing season, canned salmon export stocks consisting of 800,000 cases of red (sockeye) salmon, 650,000 cases of pink salmon, and 75,000 cases of silver salmon had been consigned to the Japan Canned Salmon Joint Sales Company as of September 18, 1965. A large part of those stocks had already been committed to buyers in the United Kingdom. Sales had also been made to France, Italy, and Australia.

As a result of a good salmon catch, Japanese canned salmon exports in 1965 are expected to exceed the 2,020,000 cases exported in 1964 and 2,130,000 cases shipped in 1963.

For September-October 1965 shipment, Japanese export price quotations per case (48  $\frac{1}{2}$ -lb. cans) were reported as 156 shillings (US\$21.84) for red salmon (to the United Kingdom) and \$12.20 for pink salmon. Compared with prices to Europe in 1964, that was a decline of about \$0.56 a case for red salmon, but an increase of \$0.70 a case for pink salmon. The world market was influenced by the United States and Canadian salmon catch in 1965 which yielded a good pack of red salmon but a poor pack of pink salmon. North American firms are said to be thinking of importing Japanese canned pink salmon for the first time in 3 years. (Nihon Keizai, September 20, 1965.)

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#### FROZEN SWORDFISH EXPORT VALIDATIONS TO THE U. S. AND CANADA, APRIL-AUGUST 1965:

Japanese export validations of frozen broadbill swordfish (mostly fillets and chunks)

## Japan (Contd.):

to the United States and Canada in August 1965 totaled 569 short tons valued at US\$438,551. This compared with 406 tons in August 1964 valued at \$235,967.

The July 1965 export validations of that species to the United States and Canada were 312 tons valued at \$224,510. In the same month of 1964 they were 200 tons valued at \$112,573.

For the 5 months April-August 1965, Japan's export validations of frozen swordfish to the same countries totaled 1,694 tons valued at \$1.2 million. Fillets of that species accounted for 68 percent of the total, with the remainder consisting of chunks and swordfish processed in other forms. For the same 5 months in 1964, the frozen swordfish export approvals totaled 1,153 tons valued at \$641,086. (Fisheries Attache, United States Embassy, Tokyo, October 5, 1965.)

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#### CANNED SHRIMP EXPORTS, JULY-AUGUST 1965:

Japan's exports of canned shrimp (24  $\frac{1}{2}$ -lb. cans per case) during July-August 1965 were up 82 percent from the same 2 months in 1964. Shipments to the United Kingdom, the principal buyer, accounted for 67 percent of the total, or about three times more than in the same period a year earlier. The Unit-

Japan's Exports of Canned Shrimp by Country of Destination, July-August 1965 with Comparisons				
Country of Destination	1965		1964	
	July	August	July	August
	..... (Cases of 24 $\frac{1}{2}$ -Lb. Cans) .....			
United States . . . . .	18,000	5,600	8,237	20,146
United Kingdom . . . . .	79,179	19,870	16,068	16,790
Canada . . . . .	9,000	5,600	7,000	6,002
France . . . . .	1,300	4,000	700	850
Other . . . . .	485	4,315	4,450	754
Total . . . . .	107,964	39,385	36,455	44,542

States was the next largest buyer, with shipments down 17 percent from the same 2 months in 1964. (Fisheries Attache, United States Embassy, Tokyo, September 22, 1965.)

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#### EXPORTS OF CANNED CRAB MEAT, JULY-AUGUST 1964-65:

Japanese exports of canned crab meat in the 2 months July-August 1965 were up 22.4 percent from the same period in 1964. During that period, shipments to the United States

were down 37.1 percent; those to the United Kingdom increased 58 percent; and France doubled her imports of Japanese canned crab meat.

Japanese Exports of Canned Crab Meat by Country, July-August 1964-65						
	United States	United Kingdom	Canada	France	Other	Total
	..... (No. of Cases of 48 $\frac{1}{2}$ -Lb. Cans) .....					
1965 Month:						
July . . .	16,377	16,235	1,750	17,919	12,004	64,285
August . .	12,719	32,208	1,030	18,966	12,779	77,702
Total . .	29,096	48,443	2,780	36,885	24,783	141,987
1964 Month:						
July . . .	17,292	18,309	1,935	8,571	6,542	52,649
August . .	28,936	12,348	2,487	9,705	9,917	63,393
Total . .	46,228	30,657	4,422	18,276	16,459	116,042

King crab accounted for 92.6 percent of all crab meat exported in July-August 1965. The remainder was from kegani, zunai, and hana-saki crab. (Fisheries Attache, United States Embassy, Tokyo, September 22, 1965.)

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#### EXPORTS OF FROZEN FISHERY PRODUCTS OTHER THAN TUNA, APRIL-AUGUST 1965:

Japanese exports of frozen fishery products (excluding tuna) in April-August 1965 amounted to 7,482 short tons valued at US\$2,259,670. Of that total, shipments to countries in West Africa and the Union of South Africa from Japan's overseas trawl fisheries accounted for 80 percent of the quantity and 40 percent of the value.

Exports to the United States (excluding tuna) during the period totaled 908 short tons valued at \$773,562. Principal items were frozen swordfish (185 tons, value \$166,000), rainbow trout (230 tons, value \$181,000), and shrimp (101 tons, value \$170,000). (Fisheries Attache, United States Embassy, Tokyo, October 5, 1965.)

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#### EXPORTS OF FISHERY PRODUCTS AND OTHER MARINE PRODUCTS, 1960-64:

Japan's exports of fresh and frozen fish in 1964 were up 32.8 percent in quantity and 19.2 percent in value from the previous year. Exports increased for all items in that group except skipjack tuna and saury. Shellfish products exports increased 6.3 percent from

## Japan (Contd.):

Japan's Exports of Principal Fishery and Other Marine Products, 1960-1964										
Item	1964		1963		1962		1961		1960	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	Metric Tons	US\$ 1,000	Metric Tons	US\$ 1,000	Metric Tons	US\$ 1,000	Metric Tons	US\$ 1,000	Metric Tons	US\$ 1,000
<b>Fresh &amp; Frozen Fish:</b>										
Tuna, skipjack . . .	3,549	561	4,909	847	1,485	319	1,379	236	149	39
Tuna, other . . . . .	171,593	56,175	141,267	43,117	157,535	55,397	136,582	39,386	131,870	35,311
Swordfish . . . . .	9,360	5,267	8,717	4,806	10,160	6,642	9,676	6,650	7,987	5,337
Sea bream . . . . .	21,609	3,486	10,946	2,069	3,554	1,111	2,473	806	1,277	625
Mackerel . . . . .	3,004	436	2,350	350	1,434	281	518	861	343	556
Saury . . . . .	4,738	933	6,049	1,042	4,024	764	-	-	-	-
Salmon . . . . .	1,395	1,472	1,154	1,403	1,552	1,639	2,346	2,272	3,641	3,517
Other . . . . .	61,087	9,676	32,686	11,807	22,786	7,736	16,123	3,231	12,892	2,409
Total . . . . .	276,335	78,006	208,078	65,441	20,253	73,889	169,097	53,422	158,159	47,794
Whale meat . . . . .	38,752	3,611	9,068	1,144	6,928	1,139	-	-	-	-
Frog legs . . . . .	755	1,183	649	1,278	603	1,383	653	778	377	636
<b>Cured Fish:</b>										
Cod . . . . .	103	67	98	56	389	172	327	144	395	152
Other fish . . . . .	544	225	583	211	1,002	333	1,405	428	1,257	356
Shark fins (dried) . .	1,048	1,658	1,086	1,919	1,008	1,681	1,032	1,014	1,225	1,103
Other . . . . .	306	233	301	228	388	233	737	661	490	375
Total . . . . .	2,001	2,183	2,068	2,414	2,787	2,419	3,501	2,247	3,367	1,986
<b>Shellfish:<sup>1/</sup></b>										
Scallops . . . . .	63	544	61	431	85	531	97	539	143	589
Abalone . . . . .	127	1,458	120	1,161	105	894	152	1,156	190	1,075
Oysters . . . . .	2,520	603	1,175	858	2,095	550	1,886	408	2,248	431
Shrimp & lobster . . .	1,306	1,933	1,244	1,750	1,893	2,719	1,232	1,653	1,717	2,317
Squid . . . . .	6,697	1,967	6,832	1,450	2,776	417	2,387	353	2,167	283
Squid (dried) . . . .	401	209	461	306	348	381	626	561	3,123	1,103
Octopus (fresh) . . .	859	281	1,173	406	1,764	706	-	-	-	-
Other . . . . .	173	111	365	560	534	705	1,691	919	1,646	960
Total . . . . .	12,146	7,106	11,431	6,922	9,600	6,902	8,071	5,589	11,234	6,758
<b>Canned Fish &amp; Shellfish:</b>										
Salmon . . . . .	28,138	42,522	29,799	45,339	55,244	91,231	26,621	37,094	37,512	57,367
Tuna . . . . .	26,407	24,950	23,874	22,719	20,747	19,592	29,436	25,106	20,944	17,367
Tuna, skipjack . . .	11,773	8,900	12,490	9,833	13,959	10,883	5,503	4,256	11,447	7,958
Mackerel . . . . .	33,292	11,117	21,943	7,197	11,012	3,736	9,907	3,500	5,243	1,628
Saury . . . . .	22,734	9,136	23,356	8,489	13,979	5,627	5,804	2,186	17,829	5,783
Sardine . . . . .	641	2,778	4,675	1,744	2,831	1,169	6,082	2,450	14,439	5,475
Jack mackerel . . .	14,388	4,847	8,972	3,072	8,400	2,917	12,811	4,283	-	-
Crab meat . . . . .	4,886	12,844	4,005	10,964	3,986	10,806	4,345	11,858	4,620	11,661
Shrimp & lobster . . .	1,946	3,353	2,033	3,504	1,274	2,378	230	475	44	105
Squid . . . . .	3,604	1,131	3,824	1,264	3,198	1,108	2,751	839	2,848	797
Other shellfish . . .	5,356	4,667	4,997	4,589	5,029	4,328	5,019	4,161	4,487	3,700
Bonito <sup>2/</sup> . . . . .	478	694	276	428	200	308	239	367	82	136
Other . . . . .	15,036	9,158	11,179	8,794	9,911	7,891	4,190	2,428	11,579	4,248
Total . . . . .	168,679	136,097	151,423	127,936	149,770	161,975	112,938	99,003	131,074	116,225
<b>Other Products:</b>										
Kelp . . . . .	1,120	522	929	392	953	414	929	469	825	378
Laver <sup>3/</sup> . . . . .	768	119	125	122	41	292	39	261	23	294
Agar-agar . . . . .	589	2,011	378	1,311	471	1,687	509	2,128	500	1,833
Whale oil <sup>4/</sup> . . . . .	80	16,672	117	18,211	70	8,336	101	19,247	81	15,147

<sup>1/</sup>Includes fresh, frozen, salted, and dried.<sup>2/</sup>Boiled and dried--canned.<sup>3/</sup>In 1,000 sheets.<sup>4/</sup>Baleen oil (in 1,000 metric tons).

Source: Japanese Ministry of Agriculture and Forestry, Statistical and Survey Division.

the previous year and the value was up 2.7 percent.

The 1964 exports of canned fish and shellfish increased 11.4 percent in quantity and 6.4 percent in value from the previous year.

Exports were up for canned tuna, mackerel and jack mackerel, and crab meat, but were lower for canned salmon, saury, and sardines. (Fisheries Attache, United States Embassy, Tokyo, June 2, 1965.)

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## Japan (Contd.):

## EXPORTS OF MARINE PRODUCTS, JUNE 1965:

Japan's exports of marine products in June 1965 amounted to 33,206 metric tons valued at US\$15.3 million. Fresh and frozen fishery products accounted for 65.8 percent of the month's total exports in quantity and 45.1 percent in value.

Japan's Exports of Marine Products, June 1965				
Product	June 1965		January-June 1964	
	Quantity	Value	Quantity	Value
	Metric Tons	US\$ 1,000	Metric Tons	US\$ 1,000
<b>Fresh &amp; frozen:</b>				
Tuna, skipjack . . . .	684	97	3,385	469
Tuna, other . . . . .	16,274	5,125	84,630	26,994
Marlin . . . . .	566	381	4,809	3,248
Sea bream . . . . .	2,291	345	9,929	1,512
Mackerel . . . . .	143	31	1,562	320
Saury . . . . .	353	86	2,963	978
Other fish . . . . .	1,531	863	17,788	4,799
<b>Total fresh &amp; frozen</b>	<b>21,842</b>	<b>6,928</b>	<b>125,066</b>	<b>38,320</b>
Whale meat . . . . .	39	25	26,165	2,536
Frog legs . . . . .	119	189	237	384
<b>Cured:</b>				
Cod . . . . .	6	6	34	28
Boiled and dried . . .	17	17	247	114
Shark fins . . . . .	99	155	578	855
Other . . . . .	10	11	126	89
<b>Total cured . . . .</b>	<b>132</b>	<b>189</b>	<b>985</b>	<b>1,086</b>
<b>Shellfish, etc.:</b>				
Scallops . . . . .	3	22	12	97
Oysters . . . . .	15	14	1,732	356
Shrimp . . . . .	139	236	763	1,317
Squid . . . . .	891	248	3,113	848
Octopus (fresh) . . .	175	86	528	233
Other . . . . .	4	30	99	285
<b>Total shellfish, etc.</b>	<b>1,227</b>	<b>636</b>	<b>6,247</b>	<b>3,136</b>
<b>Canned:</b>				
Salmon . . . . .	458	697	5,764	8,472
Tuna, skipjack . . . .	594	453	4,553	3,395
Tuna, other . . . . .	3,185	2,800	9,194	10,064
Mackerel . . . . .	1,989	675	10,453	3,456
Saury . . . . .	278	122	6,453	2,614
Sardine . . . . .	64	22	571	222
Horse mackerel . . . .	1,130	345	7,998	2,659
Crabs . . . . .	148	436	2,297	3,525
Shrimp . . . . .	14	22	244	475
Squid . . . . .	7	3	111	36
Other shellfish . . . .	526	436	1,977	1,778
Other canned products	1,292	1,031	9,314	6,782
<b>Total canned . . .</b>	<b>9,685</b>	<b>7,042</b>	<b>58,949</b>	<b>43,478</b>
<b>Other products:</b>				
Agar agar . . . . .	88	308	443	1,533
Whale oil (baleen) . .	-	-	71,500	15,820
<b>Seaweed:</b>				
Kombu . . . . .	74	31	493	214
Laver . . . . .	1/	11	2/1,661	108
<b>Grand total . . . .</b>	<b>33,206</b>	<b>15,348</b>	<b>-</b>	<b>106,615</b>

1/Not available.

2/In 1,000 sheets.

Source: Japan's Ministry of Agriculture and Forestry.

Exports of canned fish products in that month accounted for 29.2 percent of the total in quantity and 45.9 percent in value. (Fisheries Attache, United States Embassy, Tokyo, October 14, 1965.)

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## BERING SEA FISHERY TRENDS:

The Japanese factoryships Hoyo Maru (14,111 gross tons), Soyo Maru (11,192 gross tons), Gyokuei Maru (10,357 gross tons), and Tenyo Maru (11,581 gross tons), as of early September 1965, had met their fish meal production targets or were expected to reach them before season's end. The firms operating the factoryships in August had concluded contracts to sell 32,500 metric tons of meal on the domestic market at 73,000 yen (US\$203) a metric ton and were planning to export 2,500 tons. However, the four fleets were expected to exceed their combined production target of 35,000 tons by about 7,000 tons. The 7,000 tons are expected to be sold on the domestic market at a price higher than the earlier contracted price. (Suisan Tsushin, September 16 1965.)



Fig. 1 - Japanese fish meal factoryship Soyo Maru. Men at left are selecting more desirable varieties to be processed for human use.

Note: The fish meal factoryships are expected to show profits ranging from \$275,000 upwards to \$550,000 due to excellent produc-



## Japan (Contd.):

tion and high fish meal and oil prices, up \$33 a ton and \$55 a ton, respectively, from last year's prices. It is noteworthy that in previous years Japanese fish meal factoryship operators have not generally fared well. The firm which pioneered the development of the Bering Sea fish meal fishery in the late 1950's pulled her two fleets out of that fishery for two years (1962-63) due to the tremendous losses it suffered, only to re-enter the fishery with one fleet in 1964. Where effort was formerly concentrated on harvesting flatfish, primary effort now is in catching Alaska pollock.

Of the 14 Japanese factoryship fleets licensed to operate in 1965 in the central and eastern Bering Sea, 6 had ended operations and 8 were still on the fishing grounds as of early September 1965. They are the Soyo Maru (11,192 gross tons); Tenyo Maru (11,581 gross tons); Einin Maru (7,482 gross tons); Gyokuei Maru (10,357 gross tons); Shikishima Maru (10,144 gross tons); Aso Maru (3,500 gross tons); Chichibu Maru (7,420 gross tons); and Hoyo Maru (14,111 gross tons).



Fig. 2 - Japanese shrimp factoryship Einin Maru.

As of September 11, the 14 fleets had landed a total of over 342,000 metric tons of fish, consisting of 215,000 tons of Alaska pollock, 37,200 tons of rockfish, 33,400 tons of herring, 25,300 tons of flatfish, 17,500 tons of cod, 9,000 tons of shrimp, 3,400 tons of sable-

fish (black cod), and 1,800 tons of halibut. This is equal to about 85 percent of their combined production target. (Suisan Keizai Shim-bun, September 17, 1965.)

The Japanese shrimp factoryship Einin Maru (7,482 gross tons) had produced as of September 14, 1965, the equivalent of 131,000 cases (48 cans) of shrimp packed in Japanese No. 2 tuna cans (solid content 4.48-ozs.), in addition to 1,000 metric tons of headless and heads-on frozen shrimp. The factoryship was expected to meet only about 80 percent of her production target of 180,000 cases when she ended operations in late September. (Suisan Tsushin, September 16, 1965.)

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### SAURY FISHERY TRENDS, MID-OCTOBER 1965:

Saury fishing was off to a poor start off northern Japan on the Pacific side of Honshu, with strong fishing competition between Japanese, Soviet, and South Korean vessels, according to the October 14, 1965, issue of the Japanese periodical Mainichi Shimbun. Following are excerpts from that article in Mainichi Shimbun:

Six or seven years ago, the U.S.S.R. began to fish for saury off Japan along the Pacific Coast of Honshu, and in the fall of 1965, the Soviets had seven motherships supporting their saury fleets off Honshu. In addition, vessels from South Korea were also fishing for saury in that area with Sanriku as a base. About 500 Japanese saury fishing vessels were working in the same area. However, the saury catch as of mid-October was very light. As a result, ex-vessel prices were up sharply. For example, saury landings at Onahama (Fukushima Prefecture) up to October 10, 1965, were 1,700 metric tons with an ex-vessel value of 121 million yen (US\$336,100), as compared with 4,867 tons valued at 149



Soviet mothership engaged in saury fishery off Japan.

Japan (Contd.):

million yen (\$413,800) for the same period of 1964.

The Korean saury fleet off Japan consisted of the fishing vessels Torin-Go No. 55 and No. 56 with one carrier vessel.

An observer with the Korean fleet reported sighting seven Soviet saury fleets, the mother-ships of which were in the 7,000- to 10,000-ton class. One Soviet mothership was reported to have five to ten 300-ton catcher boats with it.

Note: See Commercial Fisheries Review, March 1965 p. 81; and Feb. 1965 pp. 64 and 71.

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#### GOVERNMENT'S POLICY ON IMPORTS OF ALASKA POLLOCK FROM U.S.S.R. QUESTIONED:

On August 6, 1965, the Japanese Diet's Budget Committee held a hearing on the plans of certain large fishing companies and trading firms to purchase from Soviet trawlers operating in the Okhotsk Sea Alaska pollock for processing into fish meal. The Fisheries Agency director was questioned by the committee concerning the Agency's position with regard to this development. The director stated that the Agency had received applications to import a total of 180,000 metric tons of fish from the Soviet Union and had arrived at an adjustment figure of 50,000 tons, but by no means was the 50,000 tons a firm figure and that it may be adjusted after further deliberation.

Fishermen and processors from northern Japan are strongly opposed to the importation plan and have mustered the support of their Diet representatives in an attempt to kill it. In spring 1965 (under a three-year contract beginning in 1965) one Japanese firm had purchased 36,300 metric tons of Alaska pollock for processing into meal. Those in opposition to the importation plan do not want to have the import quantity increased. (Suisan Keizai Shimbun, August 7, 1965.)

Note: See Commercial Fisheries Review, October 1965 p. 83.

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#### ALASKA POLLOCK CATCH IN SEA OF OKHOTSK AND LIVER-OIL PRODUCTION, APRIL-JUNE 1965:

The Japanese catch of Alaska pollock in the Sea of Okhotsk (landed at Hokkaido ports) in April-June 1965 amounted to 61,800 metric

tons from which 1,110 tons of liver oil was produced. During the same 3-month period in 1964 the catch was 94,000 tons and the liver-oil yield was 1,555 tons. (Fisheries Attache, United States Embassy, Tokyo, August 3, 1965.)

Note: See Commercial Fisheries Review, October 1965 p. 83.

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#### SALMON ROE IMPORTED FROM UNITED STATES:

A survey of the Japanese firms importing salmon roe from the United States and Canada shows that as of early September 1965 only about 810 short tons of roe had been purchased. That was less than half the intended purchase target of 1,800 tons. Supplies of salmon roe in the United States were light as a result of the small pink salmon run this year.

Demand for processed salmon roe continues strong in Japan. One firm was reported offering Alaskan salmon roe at the following prices: chum salmon roe 1,500-1,900 yen a kilogram (US\$1.91-2.40 a lb.); red salmon roe 1,300-1,700 yen a kilogram (\$1.64-2.15 a lb.); and pink salmon roe 1,300-1,750 yen a kilogram (\$1.64-2.21 a lb.). (Suisan Tsushin, September 15, 1965.)

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#### FISHING FIRM PLANS TO EXPLORE ANTARCTIC WATERS:

A large Japanese fishing company has submitted an application to the Fisheries Agency to explore Antarctic waters to determine the feasibility of establishing a new commercial fishery. The company plans to dispatch in October 1965 the 700-ton vessel Chiyoda Maru No. 5 to the waters south of 40° S. latitude to explore areas other than existing trawling grounds. The vessel, which will carry about 20 fishery specialists and will test different types of gear, is scheduled to be at sea for about seven months. The Fisheries Agency is expected to approve the application. (Nihon Suisan Shimbun, August 25, 1965.)

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#### ASKS FOR EXTENSION OF PRIVATE FISHERIES AGREEMENT WITH COMMUNIST CHINA:

Extension of the private fisheries agreement between Japan and Communist China was recommended in the latter part of 1965 by the Japan-China Fisheries Council (an organization representing the Japanese fishing industry). The Council's recommendation was sent

## Japan (Contd.):

to the Communist Chinese Fisheries Association. The Chinese had previously ignored requests for renegotiation of the agreement, which is scheduled to expire December 23, 1965.

The areas covered by the agreement are the Yellow Sea and the East China Sea north of 27° N. latitude and east of a line extending approximately 50 miles off the Chinese mainland. In those areas, the agreement provides, among other things, for six fishing zones where a limited number of fishing vessels from both countries may fish, and emergency ports of call for distressed fishing vessels of both countries.

The Japanese are dissatisfied with some points of the agreement, but believe it would be difficult to revise at present. Therefore, simple extension was asked by the Japanese in order to protect their fishing vessels in the areas concerned. Japan is reported to have 760 dragnet vessels and 20 trawlers operating in the areas covered by the agreement. (*Nihon Keizai*, October 8, 1965.)

Note: See *Commercial Fisheries Review*, January 1964 p. 41.

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#### JAPANESE FISHING FIRMS TO CUT BACK EQUIPMENT INVESTMENTS IN 1966:

Japan's four major fishing firms are planning to reduce their equipment investments as much as possible for 1966 and, at the same time, shift investment emphasis from expansion to modernization. This move is needed because there are few fishing grounds left for Japan to develop except for pelagic trawling, thus largely reducing the need for new vessels. Also, the firms are compelled to improve their financial position, which has greatly deteriorated in recent years because of their heavy borrowings for expansion purposes.

The firms have already reduced drastically their equipment investments in 1965, from the annual average for the five-year period from 1960-1964--one down 70 percent, one 60 percent, and the third 20 percent.

One of the four firms has decided to keep its equipment investment outlays within the limit of depreciations for the next 3-5 years and reduce the total equipment investment expenditure for 1966 to 2,600 million yen (US\$7.2

million) from 4,600 million yen (US\$12.8 million) for 1965. A second firm, which already has whittled down their 1965 capital expenditure to 2,500 million yen (\$6.9 million), is planning to reduce further the outlay for 1966. The third firm likewise is reducing such expenditure to about 1,000 million yen (\$2.8 million) for 1966 from their 1965, 2,000 million yen (\$5.6 million). The fourth, which limited its equipment investments to only 1,200 million yen (\$3.3 million) in 1965, is cutting such expenditure to about 700 million yen (\$1.9 million) for 1966. (*The Japan Economic Journal*, October 5, 1965.)

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#### FISHING VESSELS LICENSED FOR CONSTRUCTION, APRIL-JUNE 1965:

In the 3 months, April-June 1965, the Japanese Fisheries Agency approved the construction of 170 fishing vessels--86 steel vessels (totaling 12,664 gross tons) and 84 wooden vessels (totaling 3,041 gross tons) for a combined total of 15,705 gross tons.

In the same 3 months of 1964, the Agency approved the construction of 100 vessels (68 steel vessels totaling 27,257 gross tons and 32 wooden vessels totaling 1,091 gross tons) for a total of 28,348 gross tons. More steel vessels for the tuna and bonito fishery were licensed for construction in April-June 1964 than in the same period of 1965. Also, approval for the construction of 3 steel fish carriers (totaling 12,920 gross tons) accounted for the larger gross tonnage of a year earlier. (Fisheries Attache, United States Embassy, Tokyo, August 11, 1965.)

Note: See *Commercial Fisheries Review*, July 1965 p. 81.

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#### NEW PORTABLE TUNA CATCHER VESSELS:

In early September 1965, a Japanese shipyard delivered to a Japanese fishing company



New portable tuna catcher vessel *Eiryu Maru No. 1*.

## Japan (Contd.):

three new portable tuna catcher vessels (the Eiryu Maru No. 1, No. 2, and No. 3). Specifications of the new vessels are length between perpendiculars 15.5 meters (50.8 feet), width 3.7 meters (12.1 feet), depth 1.45 meters (4.8 feet), and gross tons 19.7. Each vessel is equipped with a 90-horsepower Diesel engine giving a speed of about 9 knots. The Japanese builder has launched 28 similar vessels since 1960. (Fisheries Attache, United States Embassy, Tokyo, September 20, 1965.)

\* \* \* \* \*

#### IMPROVED METHOD FOR SETTING AND RETRIEVING LONG-LINE GEAR DEVELOPED:

The Japanese Government has been involved for some time in intensive studies to develop means of improving fishing efficiency to assist the depressed tuna fishing industry. The Government's Tokai Regional Fisheries Research Laboratory has succeeded in developing a new and improved method for setting and retrieving tuna long-line gear. The new method (which basically employs a reel, conveyor, line hauler, and side roller) was expected to be ready for commercial application after final trial tests in fall 1965.

Under the new method, the entire long-lining operation, setting and retrieving, is mechanized. In the setting operation, the main line (pulled off a reel by a pulley) mechanically picks up the branch lines and float lines by means of a special hook attachment as it is paid out from the stern. Gear-setting speed can be automatically adjusted to the speed of the vessel and current flow. Specially designed "D" rings are used to prevent kinking and tangling of lines. To facilitate reeling, a braided rope is used for the main line instead of the usual three-strand rope.

In retrieving the gear, the long-line is hauled in from the starboard side of the vessel, over a specially designed side roller, by means of a line hauler. The main and branch lines are unhooked and separated as they come over the roller, and the branch lines are wound with a spooling device. A conveyor installed on the port side transports the branch lines and float lines to the stern for the next setting. In removing tuna from the branch line, a winch-operated rope is used to haul the fish into a tube to prevent struggling.

Cost of installing the reel and other mechanical devices is expected to run between 2-2.5 million yen (US\$5,556-6,945) per vessel. (Suisan Keizai Shimbun, September 22, 1965.)



## Kenya

#### CANNERY FOR SHRIMP AND SPINY LOBSTER PLANNED IN COASTAL AREA:

The Kenya Government has been consulting with a British firm on the establishment of a fish-canning industry at Lamu (located on the coast), according to a report from a bank in Nairobi.

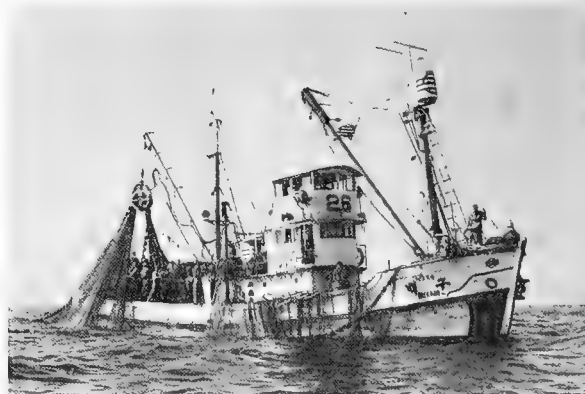
Hopes are that a cannery will be built there to pack spiny lobster and shrimp caught in the Indian Ocean. (Fishing News, September 3, 1965.)



## Republic of Korea

#### LARGE-SCALE EXPANSION OF FISHING INDUSTRY PLANNED:

Upon the ratification in October 1965 of the normalization agreement (concluded in June between the Governments of Japan and South Korea), the Republic of Korea (ROK) will undertake a massive buildup of her fishing industry with funds provided by Japan. A total of US\$190 million (\$100 million from a total of \$300 million in reparations owed to the ROK, plus \$90 million from the fisheries aid fund which Japan agreed to provide to the



A Korean mackerel seiner equipped with a power block for hauling in the huge net. This is an indication that Korea is modernizing its fleet.

## Republic of Korea (Contd.):

ROK under the normalization agreement) is expected to be made available over an eight-year period for the construction of fishing vessels, processing and other industry-connected facilities, and related programs. The Japanese Fisheries Agency is engaged in working out guidelines so that aid can be granted to the ROK.

According to available reports, the ROK plans to spend the \$90 million of fisheries aid fund within three years in the following manner:

Period	Item	Cost US\$
First Year:	Import 253 fishing vessels	37,784,000
	Construct 122 fishing vessels <sup>1/</sup>	8,670,000
	Construct processing facilities	825,000
	Other related enterprises	11,000,000
	Total	58,279,000
Second Year:	Import 5 fishing vessels	6,800,000
	Construct 118 fishing vessels <sup>1/</sup>	10,845,000
	Construct processing facilities	1,050,000
	Other related enterprises	350,000
	Total	19,045,000
Third Year:	Import 1 fishing vessel	2,000,000
	Construct 73 fishing vessels <sup>1/</sup>	8,874,000
	Construct processing facilities	1,475,000
	Total	12,349,000
	Grand Total	89,673,000

<sup>1/</sup>Parts to be furnished by Japan for assembly in Korea.

Imports in the first year are to include 76 trawlers of 100 tons each, 126 surrounding-net vessels (broken down into 21 "parent" vessels of 100 tons each and 63 "light" vessels, of 40 tons, and 42 carrier vessels of 150 tons), 45 tuna long-liners of 250 tons each, 5 refrigerated carrier vessels of 500 tons each, and 1 stern trawler of 1,500 tons. During the second year, the ROK plans to import four 1,500-ton and one 3,460-ton stern trawlers, and in the third year another 3,000-ton vessel.

Types and sizes of vessels which the ROK plans to construct during the three-year period include 124 large trawlers of 100 to 120 tons each, 77 medium-type and shrimp trawlers of 50 to 60 tons, 45 tuna long-liners of 250 tons, 10 tuna vessels of 70 tons, 42 carrier vessels (for the surrounding-net fleet) of 150 tons, 10 whaling vessels of 80 tons, and 5 refrigerated carrier vessels of 500 tons--a total of 313 vessels.

In addition, also within the first three years, the ROK reportedly plans to spend from the reparation payment of \$100 million allotted for fisheries \$5,327,000 for the importation of 89 fishing vessels and \$14,951,000 for other fisheries facilities and programs. (*Suisan Keizai Shimbun*, September 20, 1965, *Suisan-cho Nippo*, September 30, 1965, and other sources.)



## Mexico

### AGREEMENT REACHED IN WEST COAST SHRIMP VESSEL TIE-UP:

The Mexican West Coast shrimp industry is under way again following agreement early in October 1965 between vessel owners and fishermen's cooperatives concerning shares and method of payment. Negotiations to renew contracts commenced in June 1965 but neither group was willing to compromise until after two weeks had been lost of the 1965/66 season. All privately-owned vessels remained in port when the season opened on September 15 because of the deadlock in contract negotiations, and only those owned by the cooperatives put out to sea.



Part of the large number of shrimp vessels operating out of the Port of Mazatlan.

During the lengthy negotiations, both the vessel owners and the cooperatives, which provide the crews, claimed that they needed a larger share of the proceeds than was specified in the expired contract in order to break even. The National Chamber of the Fishing Industry, representing the vessel owners, prepared an economic study of the shrimp fishery which when presented became the basis of discussions. Various proposals were made, ranging all the way from virtually outright nationalization of the industry to bypassing the cooperatives completely.

## Mexico (Contd.):

Meanwhile the few cooperative vessels that started fishing out of Mazatlan had spotty fishing and those at Guaymas did fairly well. A hurricane in September sank over 20 unmanned vessels that were moored at the dock in Mazatlan.

The Government played a big role in bringing the two groups together. They agreed in writing to a seven-year contract, the details of which were being worked out. Previous contracts have been for two years, so the longer term will encourage greater stability in the industry.

Pending further contract details the fleet went to sea. The principal feature of the agreement is in the sharing of costs and proceeds. Instead of 45 percent of the gross, the cooperatives will receive 54 percent. This amount will be paid in the form of shrimp as soon as the shrimp are delivered and sorted for size, rather than a later payment in money. This removes a cause of friction, and both owners and cooperatives will ship their own shrimp as exporters. Although receiving more shares, the cooperatives will pay more of the operational costs. In addition to the traditional cost of groceries for the crew, the cooperatives will now pay for diesel oil, gasoline, and lubricants. The vessel owners, with their share reduced to 46 percent, will continue to pay only for the fishing gear and its maintenance and vessel maintenance.

In early October, contracts were settled with Mexican shrimp fishermen to resume fishing in the open waters of Baja California. Fishing was reported to be exceptionally good and much better than at the same time a year earlier.

Shrimp fishing by canoes inside the coastal lagoons started on September 1 and was said to be also much better than a year earlier. (Regional Fisheries Attache, United States Embassy, Mexico, September 14 and October 6, 1965.)

Note: See Commercial Fisheries Review, November 1964 p. 98.

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#### UNITED NATIONS SPECIAL FUND PROJECTS TO AID FISHERIES DEVELOPMENT:

Mexican fisheries may receive substantial aid from the United Nations Special Fund.

A 2-year survey of all types of resources (including fisheries) in the Mexican State of Oaxaca is being carried out jointly by the United Nations Special Fund and the Mexican Government. Approved in June 1965 by the Special Fund, the project is designed to gather data that can be used immediately to plan development projects. It should also train Mexican personnel in resource analysis techniques. The survey is in some respects a pilot operation that could lead to similar programs in other Mexican states. The Special Fund is contributing US\$692,500 for the Oaxaca survey and the Mexican Government is contributing \$75,000. The Food and Agriculture Organization is serving as the executing agency.

The resources survey should aid a separate Mexican fish retailing project begun in May 1964 by the Oaxaca State Government. The State project has rapidly increased fish consumption in Oaxaca by making fresh and frozen fish available at low prices. (The heart of the project is a retail store, freezer, and cold storage in the capital city of Oaxaca.) The object of the retailing project is to develop the State's fisheries and relieve the serious shortage of animal protein in the diet of the people of Oaxaca.

In the fall of 1965, another Mexican proposal for a 4-year fishery research project was awaiting consideration by the Special Fund. For that project, Mexico offered \$3,204,406 and requested \$1,801,700 from the Special Fund. The money would be used to widen the activities of the Mexican National Institute for Bio-Fisheries Research. The funds would expand the expert staff of the Institute and provide it with training fellowships; equipment including exploratory and research vessels would also be provided. The project would be concerned not only with basic research on Mexico's fishery resources, but also with fishing methods and marketing. It was hoped that the project, if approved, would resolve technical problems related to conservation, fishing methods, processing, transport, and commercial distribution. Systematic research into domestic and export markets would be carried out. The marketing research would involve data collection and cost studies.

If approved, the Mexican research program would probably be coordinated with Special Fund regional fisheries programs in Central America and the Caribbean. While awaiting



## Mexico (Contd.):

approval, the Mexican Bureau of Fisheries was proceeding with plans to mesh its work with that of the proposed project. (United States Embassy, Mexico, D.F., March 30 and August 10, 1965.)

Note: See Commercial Fisheries Review, July 1965 p. 84, May 1965 p. 55, Jan. 1965 p. 60.

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YUCATAN'S FISHING INDUSTRY EXPANDS:

The fishing industry in Mexico's State of Yucatan has expanded rapidly in the past few years with total landings for 1964 estimated at 8,000 metric tons. This was 43 percent more than the 5,600 tons landed in 1961, or an increase each year of about 14 percent. In 1956, total landings amounted to 2,500 tons.

The main fishing area is centered in the district of Progreso, and to a lesser extent in Dzilam, Telchac, and Celestun. The most important commercial species is jewfish (warsaw) or "mero" which accounted for about 80 percent of the total landings in 1961, most of it for export to the United States.

Yucatan has a coastline extending for 275 miles in the Bay of Campeche (Gulf of Mexico), with a continental platform of approximately 3,500 square miles. Shrimp fishing is difficult because of the rocky bottom, but excellent conditions exist for hook-and-line fishing for jewfish at relatively shallow depths and of red snapper at greater depths.

The Yucatan fishing industry is reported to be well organized and there are good prospects for even faster growth in the future. A project is planned for the construction of a fishing port at Cienega de Progreso which would greatly promote the development of the fishing industry of Yucatan. The project was reported to have been submitted to the National Advisory Commission on Fisheries, but had not yet been approved. The construction of that port is considered essential for the development of the fishing industry in Yucatan since there is no safe harbor for fishing craft at present in the state.

It is also considered that there are possibilities for expanded production by increasing the catch of species other than jewfish, such as Spanish mackerel (*sierra*), shark, turtles, and octopus. (United States Embassy, Mexico, D.F., September 28, 1965.)



## North Viet-Nam

FISHING FLEET EXPANDS WITH SOVIET AID:

In May 1965, a North Vietnamese crew arrived in the Black Sea port of Sevastopol to take delivery of the first of three freezer trawlers being built for North Viet-Nam by a Soviet shipyard. The other two vessels were to be delivered before the end of 1965. The trawlers, each of which is to be manned by a crew of 30, should be able to stay at sea over 50 days. Each vessel has a daily freezing capacity of 6-7 metric tons of fish and a hold capacity of 200 metric tons.

The three freezer trawlers will be a significant addition to the small but growing North Vietnamese fishing fleet. Before 1954, North Vietnamese fishermen operated their sampans, junks, bamboo rafts, and other primitive craft close to land. Most of the fishing craft were small (less than 5 gross tons) and lacked engines. However, about 10 years ago North Viet-Nam began receiving larger motorized boats as aid from other countries. East Germany, Communist China, and the Soviet Union were the major suppliers of modern fishing vessels. Japan supplied four motorized fishing vessels in 1958.

In 1956, the Soviet Union was instrumental in sponsoring the West Pacific Fisheries Commission, which was organized to conduct fishery research and to exchange technical information among the five Asian Communist Nations (North Viet-Nam, Communist China, North Korea, Mongolia, and the Soviet Union). The Commission meets yearly, alternating its meetings among the capitals of the signatory powers. The 9th session was held in Hanoi on November 10, 1964. It is believed that it was at that meeting that North Viet-Nam asked the Soviet Union to implement the provisions of a technical cooperation agreement to provide extensive fisheries aid to North Viet-Nam. While full details of Soviet North Viet-Nam relations in fisheries are not known, it appears that the Soviet Union promised North Viet-Nam some modern fishing vessels.

In 1960-62, the Soviet Union and North Viet-Nam conducted joint exploratory and scientific research in the Gulf of Tonkin. The purpose of that research program was to assess fish and shellfish resources in the Gulf and to find ways to help North Viet-Nam use them more extensively and more efficiently. The waters of Viet-Nam are reported to be rich in sar-



## North Viet-Nam (Contd.):

dines, anchovies, tuna and tunalike fish, sharks, and squid.

Note: See Commercial Fisheries Review, July 1962 p. 104.



## Norway

## EXPORTS OF CANNED FISHERY PRODUCTS, JANUARY-MARCH 1964-1965:

Norwegian exports of canned fishery products in the first quarter of 1965 were up 23 percent in quantity and 20 percent in value from those in the same period of 1964. The

increase was due mainly to larger shipments of smoked small sild in oil. Exports were also up for most other Norwegian canned fishery products, with the exception of smoked brisling in tomato, unsmoked small sild in oil, soft herring roe, and shellfish.

In January-March 1965, the United States continued to be the leading buyer of Norwegian canned fishery products, taking 45 percent of total shipments, followed by the United Kingdom with 13 percent. (Norwegian Canners Export Journal, July 1965.)

Note: See Commercial Fisheries Review, Aug. 1965 p. 90, and Oct. 1964 p. 74.

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Table 1 - Norwegian Exports of Canned Fishery Products by Type, January-March 1964-1965

Product	January-March 1965			January-March 1964		
	Quantity	Value		Quantity	Value	
	Metric Tons	1,000 Kroner	US\$1,000	Metric Tons	1,000 Kroner	US\$1,000
Smoked brisling in oil . . . . .	1,675	11,921	1,665	1,327	8,934	1,248
Smoked brisling in tomato . . . . .	135	738	103	162	912	127
Smoked small sild in oil . . . . .	3,114	12,968	1,811	2,259	9,841	1,374
Smoked small sild in tomato . . . . .	524	1,869	261	374	1,342	187
Unsmoked small sild in oil . . . . .	61	213	30	172	568	79
Small sild packed otherwise . . . . .	219	834	116	97	364	51
Kippered herring . . . . .	927	4,188	585	754	3,380	472
Mackerel . . . . .	175	869	121	159	765	107
Roe, unclassified . . . . .	275	1,174	164	163	626	87
Soft herring roe . . . . .	57	349	49	134	679	95
Fish balls . . . . .	121	327	46	118	305	43
Other canned fish . . . . .	22	159	22	21	160	22
Shellfish . . . . .	310	2,815	393	411	4,151	580
Total . . . . .	7,615	38,424	5,366	6,151	32,027	4,472

Table 2 - Norwegian Exports of Canned Fishery Products<sup>1/</sup> by Country of Destination, January-March 1964-1965

Country of Destination	January-March 1965			January-March 1964		
	Quantity	Value		Quantity	Value	
	Metric Tons	1,000 Kroner	US\$1,000	Metric Tons	1,000 Kroner	US\$1,000
Finland . . . . .	125	575	80	54	292	41
Sweden . . . . .	199	914	128	85	414	58
Belgium-Luxembourg . . . . .	162	789	110	157	754	105
Ireland . . . . .	87	352	49	49	207	29
France . . . . .	57	261	37	67	265	37
Netherlands . . . . .	47	188	26	46	157	22
United Kingdom . . . . .	983	4,579	640	1,202	5,823	813
West Germany . . . . .	268	973	136	181	710	99
Czechoslovakia . . . . .	58	252	35	97	313	44
East Germany . . . . .	621	2,102	294	2/	2/	2/
South Africa Republic . . . . .	510	2,000	279	466	1,853	259
Iraq . . . . .	8	30	4	40	150	21
Canada . . . . .	254	1,658	231	149	899	125
United States . . . . .	3,411	19,192	2,680	2,544	13,856	1,935
Australia . . . . .	423	1,707	238	460	1,845	258
New Zealand . . . . .	59	251	35	107	465	65
Other countries . . . . .	259	1,029	144	237	896	125
Total <sup>3/</sup> . . . . .	7,531	36,852	5,146	5,941	28,899	4,036

<sup>1/</sup>Does not include exports of canned shellfish.

<sup>2/</sup>Data not available.

<sup>3/</sup>Totals are slightly different than the combined exports of canned fish (excluding shellfish) shown in table 1.

Note: Norwegian Kroner 7.16 equal US\$1.00.

## Norway (Contd.):

CANNED FISH EXPORTS,  
JANUARY 1-JUNE 26, 1965:

Preliminary data show that Norway's total exports of canned fishery products during January 1-June 26, 1965, were down about 5 percent from those in the same period of 1964. Exports were somewhat lower in 1965 for smoked small sild, soft herring roe, and shellfish, but there was a small increase in shipments of brisling and kippered herring.

Norwegian Exports of Principal Canned Fishery Products, January 1-June 26, 1965, with Comparisons		
Product	1965	1964
	Jan. 1-June 26	Jan. 1-June 27
	..... (Metric Tons) .....	
Brisling .....	2,966	2,845
Smoked small sild .....	6,182	6,365
Kippered herring .....	1,671	1,516
Soft herring roe .....	566	957
Sild delicatessen .....	288	220
Shellfish .....	656	846
Other fishery products ..	1,304	1,558
Total .....	13,633	14,307

In 1965, the Norwegian canning season opened on May 1 for small sild and on May 19 for brisling. By July 24, 1965, the pack was 232,100 standard cases of small sild and 240,762 standard cases of brisling. At the same date in 1964, the pack was 226,058 cases of small sild and 278,485 standard cases of brisling. The decline in the brisling pack was due to a disappointingly small catch of brisling. (Norwegian Cannery Export Journal, August 1965.)

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NORTH SEA HERRING FISHERY  
CONTINUES GOOD IN OCTOBER 1965:

In the first half of October 1965, the Norwegian catch of herring in the North Sea area totaled 1,125,000 hectoliters (104,625 metric tons), or 3 times as much as was taken in all of October 1964. The fat content of the herring caught in October 1965 was still at the high level of 20-22 percent. (The Export Council of Norway, Oslo, October 1965.)



## Panama

## FISHERIES DEVELOPMENT OUTLOOK:

Shrimp is Panama's major fishery--shrimp exports in 1964 were valued at US\$7.3 mil-

lion. In the past, the Government of Panama has tried to stimulate the use of other fishery resources that appear abundant off Panama, but with only moderate success. Now, however, the outlook is improving.



Fig. 1 - One of the more modern trawlers docked at a shrimp-plant unloading dock in Panama City.



Fig. 2 - Three shrimp plants are located in this area of Panama City. Trawlers fish shrimp for the plants.

New investment in Panama's fishing industry is being actively encouraged by the privately-owned development bank, Desarrollo Industrial, S.A., and the Government-controlled Banco Nacional. Financial assistance to help build a new boatyard is being sought from those banks by the Panamanian owners of a new \$2 million fish meal plant being built near Panama City. They are interested in a boatyard that can build 100-ton vessels to supply their reduction plant with anchoveta and thread herring.

Panamanian fisheries may also be aided by the Central American Fishery Development Project sponsored by the United Nations Special Fund. The impact of the United Nations project will partly depend upon the success of the Panamanian Government in stimulating

## Panama (Contd.):

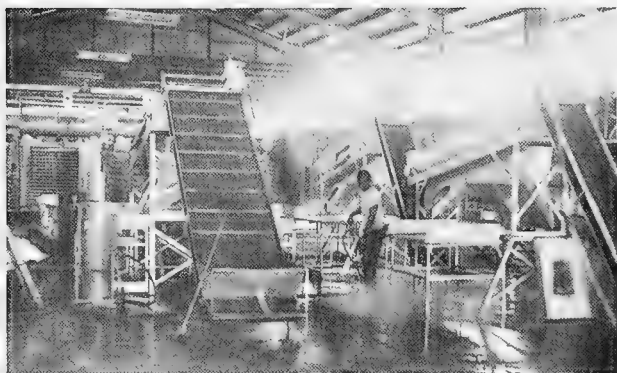


Fig. 3 - The most modern shrimp plant in Panama City has two sorters—one for large and the other for titi shrimp.

new investment and activity in the country's fisheries. (United States Embassy, Panama City, May 19, and October 8, 1965.)



## Persian Gulf

### BRITISH-ARABIAN SHRIMP FISHING VENTURE TO BE MANAGED BY UNITED STATES EXPERTS:

A shrimp technologist from Atlanta, Ga., has been appointed general manager of a British firm formed to develop a shrimp fishery in the Persian Gulf. A shrimp vessel captain from Brownsville, Tex., was also slated to join the firm to act as lead skipper of an initial fleet of seven 70-foot shrimp vessels. The first of those vessels, the Ross Larkspur, was scheduled to arrive in the Middle East in early September 1965. At that time, a 200-foot refrigerated mothership for the trawler fleet was being fitted out in Florida to transport the shrimp catch. All of the vessels were to be in full operation by late 1965. (Fishing News, London, September 3, 1965.)

Note: See Commercial Fisheries Review, March 1965 p. 87.



## Philippines

### JAPANESE BIDS ACCEPTED ON CANNED FISH:

Japanese trading firms submitted successful bids (bids opened September 8-9, 1965) to NAMARCO (National Marketing Corporation) of the Philippine Islands for 100,000 cases of

canned squid, 200,000 cases of canned mackerel, and 50,000 cases of canned saury. Bids submitted by the Japanese firms were as follows (c. & f. Manila): squid US\$5.08 a case (48 15-oz. cans); mackerel \$6.80 a case (48 15-oz. tall cans) and \$3.80 a case (48 7.8-oz. cans); saury \$5.15 a case (48 8.5-oz. oblong cans). But a September 21 report indicated that bid winners had not been determined by NAMARCO. (Kanzume Nippo, September 14, Suisan Tsushin, September 21, 1965.)

Note: Type of mackerel and saury pack not specified in article. Bids for mackerel believed to be for tomato-style pack. United States exporters were reported as having bid \$8.95 a case for mackerel (48 15-oz. tall cans). Mackerel landings in Hokkaido, as of September 14, 1965, were reported to total 51,471 metric tons, up 50 percent over the same period a year ago. As of early September, Hokkaido packers had canned about 400,000 cases.



## Poland

### ATLANTIC FISHERIES EXPANSION:

Poland's Northwest Atlantic fisheries provided almost 40,000 metric tons of her 1964 marine catch of 244,000 tons. Only a small portion of that catch was taken on Georges Bank where only one Polish vessel operated in 1964 (with a reported catch of 720 tons): However, in August 1965, three Polish large stern trawlers (all newly built in 1964) began to fish on Georges Bank along with two Rumanian stern trawlers. Poland may expand fishing operations on Georges Bank. Poland has ambitious plans for fisheries development calling for her marine landings to double by 1970 (to 450,000 tons). To meet that goal, vessel construction plans call for the addition to the fishing fleet of about 35 large freezer and factory trawlers, 4 tuna vessels, 3 mother-ships, and 2 refrigerated transports. Catches in the Baltic and North Sea are to increase somewhat (to 100,000 and 120,000 tons respectively), but greater emphasis is on increasing the North Atlantic catch to 160,000 tons and the Central Atlantic catch to 70,000 tons. The long-term plans provide for another doubling of the total Polish catch to 900,000 tons by 1980.

In January 1965, the Polish fishing fleet numbered about 700 motorized vessels, most of which were small cutters (570 units). But

## Poland (Contd.):

the fleet also included large factory stern trawlers (10), factory freezer trawlers (10), steam-powered trawlers (54), side trawlers (44), base ships (2), and a supply ship (1).

Note: See Commercial Fisheries Review, October 1965 p. 94 and June 1965 p. 74.



## Portugal

CANNED FISH EXPORTS,  
JANUARY-JUNE 1965:

Portugal's total exports of canned fish in oil or sauce in the first half of 1965 were up 14 percent from those in the same period of the previous year, due mainly to larger sardine shipments.

Portuguese Canned Fish Exports, January-June 1964-1965				
Product	1965		1964	
	Jan. -June		Jan. -June	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
<u>In oil or sauce:</u>				
Sardines . . . . .	28,371	1,493	23,754	1,250
Chinchards . . . .	515	27	1,693	89
Mackerel . . . . .	2,076	83	1,709	68
Tuna & tunalike . .	1,072	36	610	20
Anchovy fillets . .	1,575	158	1,743	174
Others . . . . .	361	19	405	21
Total . . . . .	33,970	1,816	29,914	1,622

Portugal's principal canned fish buyers in the first half of 1965 were Germany with 7,500 metric tons, Italy 4,345 tons, the United Kingdom 4,251 tons, France 2,518 tons, the United States 2,622 tons, and Belgium-Luxembourg 2,435 tons. Germany's purchases of canned fish from Portugal in the first half of 1965 increased 39 percent from those in January-June 1964. Purchases by Italy and the United Kingdom were also up. But purchases by France were down. (Conservas de Peixe, August 1965.)

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CANNED FISH PACK,  
JANUARY-JUNE 1965:

Portugal's total pack of canned fish in oil or sauce in the first half of 1965 was down 17 percent from that in the same period of 1964. The decline was due to a sharp drop in the pack of sardines which offset an increase in the pack of other species. Portuguese sar-

Portugese Canned Fish Pack, Jan.-June 1965

Product	1965		1964	
	Jan. -June		Jan. -June	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
<u>In oil or sauce:</u>				
Sardines . . . . .	9,181	483	17,681	930
Chinchards . . . .	501	26	476	24
Mackerel . . . . .	2,071	82	1,635	65
Tuna & tunalike . .	4,157	138	2,176	72
Anchovy fillets . .	2,457	246	1,469	147
Others . . . . .	1,194	63	357	19
Total . . . . .	19,561	1,038	23,794	1,257

dine landings of 24,087 metric tons in January-June 1965 were down 24 percent from the 31,687 tons landed in the first half of the previous year. (Conservas de Peixe, August 1965.)



## South Africa Republic

PELAGIC SHOAL FISH CATCH,  
JANUARY-JUNE 1965:

South Africa Republic: The Cape west coast shoal fish catch for the first 6 months of 1965 was 222,291 short tons pilchards, 42,096 tons maasbanker, 43,967 tons mackerel, 73,501 tons anchovy, and 100 tons herring. The total catch was 381,855 tons. In the same period of 1964, the total catch was 351,614 tons, made up of 257,178 tons pilchards, 19,952 tons maasbanker, 55,319 tons mackerel, 16,947 tons anchovy, and 2,218 tons herring.

In the first half of 1965, the Cape shoal catch yielded 88,424 short tons of fish meal, 3,812,919 gallons of fish body oil, 1,445 short tons of canned pilchards, 4,500 tons of canned maasbanker, and 4,933 tons of canned mackerel.

South-West Africa: In the Territory of South-West Africa, the shoal catch in January-June 1965 totaled 516,163 short tons and consisted of 515,879 tons pilchards and 284 tons anchovy. (South African Shipping News and Fishing Industry Review, August 1965.)

(Editor's Note: Total fish meal production in the South Africa Republic and South-West Africa was reported as 232,822 metric tons in January-July 1965 as compared with 190,012 tons in the same period of 1964. The 1965 canning program in South-West Africa is forecast to be about the same as in 1964 when the

### South Africa Republic (Contd.):

pack of canned pilchards amounted to 62,130 short tons. The South African canned pack of other species was limited in 1964.)

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### FOREIGN FISHING OPERATIONS OFF WEST COAST:

Following is a report in the Namib Times, Cape Town, September 17, 1965, on foreign fishing operations off the west coast of the South Africa Republic:

The Atlantic waters off the South Africa Republic (includes South-West Africa) are being fished by vessels from at least eight foreign countries--the U.S.S.R., Spain, Bulgaria, Ghana, Poland, Belgium, Japan, and Israel. Most of the foreign vessels are trawlers seeking groundfish.

The Soviet Union has the largest fleet off South Africa with some 39 vessels operating between Walvis Bay and the Kunene River (which is the northern boundary of South-West Africa). The Soviet catch is delivered at sea to transports, usually for shipment back to the U.S.S.R. Other foreign vessels working with the Soviet fleet also transfer catches at sea for delivery to their home country. Soviet catches are mainly confined to bottomfish, although pilchard are caught on a small scale mainly for reduction to fish meal.

Spain has some 31 vessels operating between Cape Town and Walvis Bay. The Spanish vessels are only interested in hake, and all of their catch is sent back to Spain. Walvis Bay and Cape Town are used as transshipment ports by the Spanish fleet.

Bulgaria has 2 trawlers operating off South Africa and plans to send 4 more in 1966. The Bulgarian vessels fish with the Soviet fleet. Bulgarian catches are sent back to Bulgaria.

Ghana has two vessels on lease from the Soviets operating off South Africa. Those vessels, although flying the Ghanaian flag, are manned mainly by Soviet crews and also operate with the Soviet fishing fleet.

Poland is believed to have two trawlers working off South Africa with the Soviet fleet. Up to September 1965, only one Polish trawler had called at Walvis Bay.

Belgium has one trawler, the Narwal, operating off South Africa. The Narwal is a regular caller at Walvis Bay where she transships her catches to Belgium.

Japan operates tuna long-line vessels in the Southeast Atlantic. Those tuna vessels call at Walvis Bay regularly for stores, water, and oil. (Editor's Note: Japan has also dispatched several trawlers to fish at various points off West Africa.)

Israel has also sent fishing vessels into the Southeast Atlantic, some of which have called at Walvis Bay.

In 1966, those 8 nations may be joined by 2 more foreign countries--Britain and West Germany. Both of those countries are said to be planning to send exploratory vessels to South African waters.

Note: See Commercial Fisheries Review, Aug. 1965 pp. 67 and 80; June 1965 p. 79; Jan. 1965 pp. 90-91; June 1964 p. 42.



### South Viet-Nam

#### FISHERIES AID FROM JAPAN:

In mid-1965, the Vietnamese Fisheries Directorate in Saigon received from Japan a gift of 11 female and 12 male frogs for experimental culture. If the frogs from that initial shipment, known to have been developed by scientifically selected breeding, can be successfully raised as breeding stock, an export trade could develop.

Previous shipments of silver carp and pond smelt from Japan are showing excellent results in Vietnamese fish-farming experiments.

A 7-man team of Japanese fishery experts under contract with the U. S. Agency for International Development has been operating in South Viet-Nam since 1957, working closely with the Vietnamese Fisheries Directorate. The group has worked with coastal fishing centers giving advice and assistance concerning motorization and modern fishing techniques. Working on inland fisheries as well, the team has contributed to the general rise in Viet-Nam's fishing industry. (United States Embassy, Saigon, June 26, 1965.)



## Spain

### SOUTH AFRICAN TRAWL FISHERY TRENDS, SEPTEMBER 1965:

The hake fishery off South Africa is attracting an increasing number of Spanish trawlers. In September 1965, some 31 Spanish trawlers were reported off the west coast of the South Africa Republic. The Spanish fishery in that area was begun in 1962 by the trawlers of a firm based at Vigo, Spain. Their success attracted other Spanish trawler operators.

The South African activities of the pioneer Vigo firm include two separate operations. It has joined with interests in the South Africa Republic to develop a fish-processing plant at Saldanha Bay to produce frozen fish sticks, fish fillets, and fish blocks, as well as industrial products. That plant may be completed by the end of 1965 and is to have its own fleet of trawlers. Entirely separate from that joint venture, however, the Vigo firm is conducting its own distant-water operations off South Africa using the Spanish stern and side trawlers which have become familiar callers at Cape Town where their hake catch is transhipped in refrigerated transports to Spain.

To help support that fleet, the Vigo firm sent the 17,000-ton factoryship Galicia to South Africa in late 1964. Anchored north of Cape in St. Helena Bay outside the 6-mile territorial limit of South Africa, the Galicia has been receiving Spanish trawler catches for processing into frozen fishery products. The factoryship also reduces fish offal into industrial products.

In September 1965, the Spanish trawlers seeking hake were moving northward toward Walvis Bay in the Territory of South-West Africa. The Vigo firm was therefore exploring the possibility of using Walvis Bay both as an anchoring site for the factoryship Galicia and as a supply and transshipping port for its trawler fleet.

Meanwhile, in early September 1965, another group of 16 Spanish trawlers from Las Palmas (Canary Islands) had already begun using Walvis Bay as a transshipment port. Those vessels were fishing for hake in waters about 10 hours steaming time off Walvis Bay. The first deliveries of the Las Palmas trawlers to Walvis Bay in early September 1965 totaled 2,200 metric tons. (Namib Times,

Cape Town, September 17, 1965, and other sources.)

Note: See Commercial Fisheries Review, Jan. 1965 pp. 90-91.



## U.S.S.R.

### EXPANSION OF SOUTH ATLANTIC AND INDIAN OCEAN FISHERIES BASE ON THE BLACK SEA:

In 1961, the Soviet Federal Committee for Fisheries Production in Moscow established a new fisheries administration at Sevastopol on the Black Sea. Named the Sevastopol High-Seas Fisheries Administration (Sevastopolskoe Upravlenie Okeanicheskogo Rybolovstva--SUOR), the new administration has participated in the Soviet fisheries expansion into the South Atlantic and Indian Oceans.

The two main offshore fishing areas of Sevastopol fishermen are the southeastern Atlantic (Southwest African coast) and the Indian Ocean (Gulf of Aden, Arabian Sea, East African coast). Most Sevastopol ocean-going vessels are large stern trawlers of the "Tropik" class constructed in Eastern Germany specifically for tropical fishing operations. To get to their fishing grounds, Sevastopol vessels must transit the Dardanelles Straits and either the Gibraltar Straits or the Suez Canal.

In 1961, the SUOR landed 15,400 metric tons of fish and other marine products. Increased landings in subsequent years were made possible by a generous capital investment program enabling the administration to purchase by August 1965 over 40 oceangoing vessels manned by approximately 3,000 fishermen. As a result, the landings for the first 6 months of 1965 were reported as over 60,000 metric tons. Plans call for SUOR to purchase another 60 vessels by 1970. Landings will probably increase proportionately.

Expanded port facilities are needed for the growing fleet based on the Black Sea. The 5-year Plan for 1966-1970 calls for the berthing capacity of the Sevastopol port to increase from 5 large vessels to 15 vessels. A cold-storage plant has been built in the Kamyshevaia Bay, where the headquarters of the SUOR are located. Additional cold-storage facilities and a new cannery are also planned.

Further expansion of the Sevastopol-based operations seems probable. New areas are

## U.S.S.R. (Contd.):

being explored by the Soviet research vessels Gnevnii and Akademik Kovalevskii of the Soviet Black and Azov Sea Scientific Research Institute for Fisheries and Oceanography (Azcherniro). In 1965, the research vessel Gnevnii ended her research cruise to South Atlantic and Antarctic waters and Akademik Kovalevskii returned from a joint Soviet-Cuban Expedition studying the resources of the Caribbean Sea and the Gulf of Mexico. Several Soviet research vessels continuously investigate the fishery resources of the Indian Ocean.

Sevastopol fishermen will also participate in the newly-developing Soviet tuna fisheries. The Krasnii Luch, one of the five tuna factory-ships purchased by the U.S.S.R. in Japan, will be based on the Black Sea. On its maiden voyage from Japan to Sevastopol in the summer of 1965, that vessel fished successfully for tuna off Somalia's coast and landed 530 metric tons.

Note: See Commercial Fisheries Review, Nov. 1965 p. 72, and Oct. 1965 p. 97.

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LARGE VESSEL FISHING  
MACKEREL OFF JAPAN:

A 2,000-ton class Soviet trawler had appeared off the coast of Akkeshi, Hokkaido, fishing for mackerel in early September 1965. According to the Japanese Fisheries Agency, the Soviet Union has conducted test fishing for saury and mackerel since 1961 but this is the first time that such a large trawler has been employed for mackerel fishing. In previous years, Soviet vessels were reported fishing for saury mainly off the Kurile Islands, but in 1964 appeared for the first time as far south as 39° N. latitude off Kinkazan, Japan.

Japanese mackerel vessels operating off eastern Hokkaido are mainly vessels in the 60-ton class. These vessels are no match in fishing efficiency for the large integrated Soviet trawler. (Suisan Keizai Shimbun, September 16, 1965.)

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SOVIETS TO USE SEAWEED  
FOR ANIMAL FEED:

The Soviet Black Sea Fisheries Administration plans to use bottom seaweed from the

Black Sea for the production of fodder meal. According to the Soviets, their research showed that Black Sea algae increase the milk output of cows, the egg output of poultry, and also speed up the growth of domestic animals. Special vessels have been constructed to harvest the seaweed. Each vessel is to produce 12 metric tons of fodder meal a day.



## United Kingdom

FISHERY LOAN INTEREST  
RATES REVISED:

The British White Fish Authority announced that their rates of interest on loans made as from September 11, 1965, would be as follows:

For fishing vessels of not more than 140 feet, new engines, nets and gear: on loans for not more than 5 years,  $7\frac{3}{8}$  percent (decrease  $\frac{1}{8}$  percent); on loans for more than 5 years but not more than 10 years,  $7\frac{1}{4}$  percent (decrease  $\frac{1}{4}$  percent); on loans for more than 10 years but not more than 15 years,  $7\frac{1}{8}$  percent (decrease  $\frac{1}{4}$  percent); on loans for more than 15 years but not more than 20 years,  $7\frac{1}{4}$  percent (decrease  $\frac{1}{4}$  percent).

The rates on advances made before September 11, 1965, are unchanged. (The Fishing News, September 24, 1965.)

Note: See Commercial Fisheries Review, Oct. 1965 p. 98.

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LOBSTER HATCHING  
EXPERIMENTS IN GUERNSEY:

In the Channel Islands, the Guernsey Sea Fisheries Committee started a lobster-hatching experiment in the spring of 1965. Lobster berries (eggs) were placed within specially constructed boxes and planted in coastal waters. The lobsters were expected to hatch in about a month's time. A Guernsey fisheries officer said a critical stage in the experiment would come shortly after hatching when efforts would be made to feed the "free-floating" baby lobsters with minced calf liver.

The specially-constructed hatching boxes are about 3 feet long and have a nylon mesh shelf to hold the lobster eggs. At the port of Grand Havre, one of the boxes was planted on the ocean bottom and another was anchored 6 to 7 feet off the bottom. Two of the boxes were placed at Bordeaux harbor and others were to



## United Kingdom (Contd.):

be laid in coastal waters at Portelet, Perelle, and St. Peter Port.

The experiment is a long-term project since it will take at least 6 years for the lobsters hatched in 1965 to reach the minimum 8-inch size which can be landed in Guernsey. It is hoped, however, to eventually build up lobster stocks around the Channel Islands, possibly even to the extent of having an export surplus.

A pioneer lobster hatching experiment was carried out many years ago in the Channel Islands. During the years 1899-1905, over 200,000 young lobsters were hatched and released from several stations in the islands. In 1906, a report on that experiment said, in part, "many small lobsters about 4 or 5 inches long are now found in shallow water..." Another follow-up report in 1907 reported a good lobster catch including "a large number from 8 to 9 inches long." Unfortunately, a heat wave in 1906 apparently ended the experiment by destroying the lobster hatchery stock. (The Fishing News, London, June 25, 1965.)

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NORTH SEA CONTINENTAL SHELF  
AGREEMENTS WITH THE NETHERLANDS:

On October 6, 1965, the United Kingdom and the Netherlands signed two agreements relating to the exploration and exploitation of the North Sea bed between the two countries. The agreements were to be published and presented to the British Parliament in November 1965.

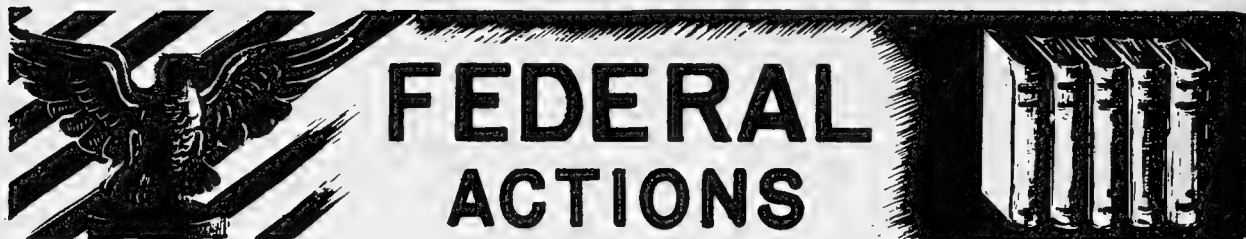
One agreement delimits the Continental Shelf between the two countries. It defines the dividing line broadly as a median between them, and establishes a procedure for settling any disputes which might arise over the position of the line. The second agreement relates to the exploitation of single geological structures extending across the dividing line.

The agreements follow similar ones signed with Norway on March 10, 1965. According to The Times, London, Britain also hopes to conclude such agreements with Denmark, Belgium, and France. The Times reported that negotiations with Denmark were in progress. (United States Embassy, London, October 9, 1965.)



## BACK ISSUES FOR 1964 AVAILABLE

Back issues of Volume 26, Numbers 1 through 12, 1964 (January through December), are still available until the supply is exhausted. Copies are available free from the Fishery Market News Service, U.S. Bureau of Commercial Fisheries, 1815 No. Fort Myer Dr., Rm. 510, Arlington, Virginia 22209. The annual index for Volume 26 (1964) is also available. There are a few complete sets of Volume 26 available.



## Department of Agriculture

### FARMERS HOME ADMINISTRATION

#### EMERGENCY LOANS TO LOUISIANA OYSTER PLANTERS FOR HURRICANE DAMAGE:

As a result of damage caused by Hurricane Betsy, the Department of Agriculture authorized emergency loans through December 31, 1966, to established oyster planters in the Louisiana Parishes of Cameron, Iberia, Jefferson, Lafourche, Livingston, Orleans, Plaquemines, St. Bernard, St. John the Baptist, St. Mary, St. Tammany, Tangipahoa, Terrebonne, and Vermilion.

The emergency loans are available through the Farmers Home Administration to enable established oyster planters to renovate their owned or leased oyster seed beds. Purpose is to help restore the oyster beds to normal. Loans may also be made to replace essential equipment needed in oyster planting operations. Oyster planters can apply for loans at the Farmers Home Administration Parish office serving their area.

To be eligible, an oyster planter must be unable to obtain the credit he needs from other local sources. He must also have suitable experience and reasonable prospects for success in the oyster-planting operations. Emergency loans are secured by a first lien on the oysters planted, on all machinery and equipment purchased, and on other chattels and real estate owned by the applicant, as necessary to protect the Government's investment. The loans bear 3 percent interest, and are expected to be paid as soon as possible consistent with the borrower's ability, but may be extended over a 3-year period.

Note: See Commercial Fisheries Review, Mar. 1963 p. 86.



## Department of the Interior

### FISH AND WILDLIFE SERVICE

#### BUREAU OF COMMERCIAL FISHERIES

#### APPLICATIONS FOR FISHING VESSEL LOANS:

Kenneth Tapp, Tebenkof Bay, Alaska, has applied for a loan from the U. S. Fisheries Loan Fund to aid in financing the purchase of a used 36-foot wood vessel to engage in the fishery for salmon.

Jack Williford, Kenai, Alaska, also has applied for a loan to aid in financing the purchase of a new 32-foot wood vessel to engage in the fishery for salmon and halibut.

Neal J. and Jan P. MacDonald, P. O. Box 357, Petersburg, Alaska, have applied for a loan from the U. S. Fisheries Loan Fund to aid in financing the purchase of a used 49.9-foot wood seine vessel to engage in the fishery for salmon and king crab in southeastern Alaska.

Edward B. Kary, Post Office Box 8, Ilwaco, Wash., has applied for a loan from the U. S. Fisheries Loan Fund to aid in financing the purchase of a used 39-foot wood vessel to engage in the fishery for crab, tuna, and salmon.

Regulations and procedures governing fishery loans have been revised and no longer require that an applicant for a new or used vessel loan replace an existing vessel (Public Law 89-85; Fisheries Loan Fund Procedures--50 CFR Part 250, as revised August 11, 1965).

In accordance with the revised regulations, notices of the respective applications of Kenneth Tapp and Jack Williford were published in the Federal Register, October 15, 1965; notice of Neal J. and Jan P. MacDonald's application was published in the Federal Register, October 23, 1965; and notice of Edward B. Kary's application was published in the Federal Register, October 28, 1965.



## Eighty-Ninth Congress (First Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.



**CONGRESS ADJOURNS:** The first session ended (adjourned sine die) Oct. 22, 1965. The second session of this Congress is scheduled to reconvene Jan. 10, 1966.

Because next year's session is merely a continuation of this year's, all legislation in the second session can be taken up at the point to which it progressed in the first session.

**ANADROMOUS FISH CONSERVATION:** S. Rept. 860, Conservation of the Anadromous and Great Lakes Fisheries (Oct. 11, 1965, report from the Committee on Commerce, U. S. Senate, 89th Congress, 1st session, to accompany H. R. 23), 26 pp., printed. Committee reported bill favorably with amendments. Discusses purpose, section-by-section analysis, cost, changes in existing law, and departmental reports.

Senate Oct. 13, 1965, passed H. R. 23, to initiate a cooperative program with the States for the conservation of the Nation's anadromous fish, with amendment, to be sent back to House for concurrence. Rep. Dingell explained in Congressional Record, Oct. 14, 1965 (p. 26047) the Senate's three technical amendments for which House concurrence was requested. One amendment limits the amount which may be received by any particular State in one year to the sum of \$1 million, although allowing, as does the House bill, any State to receive the sum of \$5 million over the life of the program which is 5 years in length. The other two amendments are technical. The second amendment simply says that the bill does not apply to the area to which the Columbia River salmon program had applied, but it says it in a little different way than the House language did. The other amendment is a very small item, striking the word "primarily" on page 2, line 4, of the House bill. Same day House concurred in the Senate amendments to H. R. 23. Would authorize the Secretary of the Interior to start with the States a cooperative 5-year program, at a total cost not to exceed \$25 million, for conservation and development of anadromous fish resources and the fish in the Great Lakes that ascend streams to spawn. Federal share of a project not to exceed 50 percent. Bill in effect to June 30, 1970. This action cleared H. R. 23 for the President's signature.

H. R. 23 was signed by the President Oct. 30, 1965 (P. L. 89-304).

**FISH PROTEIN CONCENTRATE PLANTS:** Introduced in Senate Oct. 22, 1965, S. 2720 (Bartlett and 1 other), to authorize the Secretary of the Interior to develop, through the use of experiment and demonstration plants, practicable and economic means for the production by the commercial fishing industry of fish protein concentrate; to Committee on Commerce. Sen. Bartlett in Congressional Record, Oct. 22, 1965 (pp. 27135-27136) pointed out that bill would authorize the Secretary to contract with private firms for the construction and operation of large-scale experimental plants capable of producing fish protein concentrate on a commercial basis. It has been estimated that the construction and operation of five plants the size required will involve approximately \$5 million. Congress appropriated during the past 2 years several million dollars for the development of a sample fish protein concentrate product in a small-scale model plant capable of producing 100 pounds daily. The basic experimental work has been carried out by the Bureau of Commercial Fisheries with the cooperation of the National Academy of Sciences. The United States has taken the lead in developing on a small scale an acceptable fish protein concentrate. The next step is to prove its economic feasibility.

**FOOD STUDY AND COORDINATION COMMISSION:** H. J. Res. 703 through H. J. Res. 762 were introduced in House Oct. 14, 1965; also H. J. Res. 771 (Halpern), H. J. Res. 772 (Harvey of Mich.), H. J. Res. 773 (Helstoski), introduced Oct. 19; to establish a U. S. World Food Study and Coordinating Commission to study world food and agricultural needs, to coordinate present U. S. efforts toward meeting these needs, and to evaluate the future role of U. S. agricultural and other resources in the light of present and projected world food and population trends; to Committee on Agriculture.

**IMPORT STATISTICS:** H. J. Res 696 (Dent) introduced in House Oct. 13, 1965, to require that reports on imports into the United States include the landed value of articles imported, and for other purposes; to Committee on Ways and Means.

**MARINE BIOLOGICAL LABORATORY:** H. Rept. 1160, Use of Land at La Jolla, Calif., for a Marine Biological Research Laboratory (Oct. 13, 1965, report from the Committee on Merchant Marine and Fisheries, House of Representatives, 89th Congress, 1st session, to accompany S. 1734), 5 pp., printed. Committee reported favorably without amendment. Discusses purpose, background, need for legislation, changes in existing law, and departmental reports.

House Committee on Merchant Marine and Fisheries Oct. 13, 1965, reported (H. Rept. No. 1160) on S. 1735, an act relating to the use by the Secretary of the Interior of land at La Jolla, Calif., donated by the University of California for a marine biological research laboratory, and for other purposes, without amendment; to Committee of the Whole House on the State of the Union.

House Oct. 18, 1965, passed without amendment and cleared for the President S. 1735. Signed by the President Oct 30, 1965 (P. L. 89-302). Rep. Lennon pointed out in Congressional Record, Oct. 18, 1965 (pp. 26215-26216) that the bill permits the Secretary of the Interior to reconvey the property to the regents of the University of California if and when the property was used for a purpose different from the purpose for which it was originally deeded to the Secretary of the Interior--for the construction of a Fishery-Oceanography Center.

**OCEANOGRAPHIC AGENCY OR COUNCIL:** H. Rept. 1025, Marine Resources and Engineering Development Act of 1965 (Sept. 17, 1965, report from the Committee on Merchant Marine and Fisheries, House of Representatives, 89th Congress, 1st session, to accompany S. 944), 23 pp., printed. Committee reported bill favorably with amendments. Discusses declaration of policy and purposes, background of the legislation, hearings, analysis, cost, departmental reports and changes in existing law.

H. R. 11579 (McGrath) introduced in House Oct. 13, 1965, to provide for a comprehensive, long-range, and coordinated national program in oceanography, and for other purposes; to Committee on Merchant Marine and Fisheries.

Rep. Lennon inserted in Congressional Record, Oct. 22, 1965 (pp. A6063-A6065), an article titled "A New Industry For Maritime Exploration and Development," by Dr. Edward Wenk, Jr., Chief, Science Policy Research Division, Legislative Reference Service, Library of Congress. Dr. Wenk presented this address before the American Merchant Marine Conference of the Propeller Club of the United States in Galveston, Tex., on Oct. 15. He places a new perspective on our role in the oceanographic environment.

Rep. Fascell in Congressional Record, Oct. 22, 1965 (pp. A6099-A6100), pointed out that Oceanography is an area that we would do well to turn our attention to, for we can be enriched by a knowledge of our great bodies of water as we can be from the knowledge of the space which surrounds our planet. He also inserted the address by Under Secretary of the Interior, John A. Carver, Jr., to the Atlantic States and Gulf States Marine Fisheries Commission in Miami, Fla., on Oct. 6, 1965, titled "The Oceans--A Challenge to Federal-State Leadership."

**SEA-GRANT COLLEGE CONFERENCE:** Sen. Pell in Congressional Record, Oct. 21, 1965 (p. 27023), called attention to a unique and pioneering conference in Rhode Island on Oct. 28 and 29 in conjunction with a meeting of the National Academy of Science Committee on Oceanography. The Conference, nationwide in scope, was on the concept of establishing sea-grant colleges as a means of advancing education in the developing and immensely important field of oceanography.

**STERN RAMP TRAWLERS:** Introduced in House Oct. 21, 1965, H. R. 11725 (O'Neill of Mass.), to authorize the Secretary of the Interior to construct two modern stern-ramp trawlers to be used for experimental commercial fishing, research, and for other purposes; to Committee on Merchant Marine and Fisheries.

**SHELLFISH SHELLING EMPLOYEE EXEMPTION:** Introduced in Senate Oct. 19, 1965, S. 2671 (Thurmond), to amend the Fair Labor Standards Act of 1938 in order to exempt employees employed in the shelling of shellfish from the minimum wage provisions of such act; to Committee on Labor and Public Welfare. Proposes an amendment to section 13 (a) (5) of the Fair Labor Standards Act of 1938, as amended. That section is codified as title 29, section 213 (a) (5) of the United States Code, and is one of the exemptions written into the Fair Labor Standards Act. It now exempts from the minimum wage and maximum hour sections of the Act "any employee employed in the catching, taking, propagating, harvesting, cultivating, or farming of any

kind of fish, shellfish, crustaceas, sponges, seaweeds, or other aquatic forms of animal and vegetable life, or in the first processing, canning or packing such marine products at sea as an incident to, or in conjunction with, such fishing operations, including the going to and returning from work and loading and unloading when performed by any such employee." The bill would add after the word "harvesting" the following: "including shelling in the case of shellfish." Prior to the 1961 amendments to the Act, all employees engaged in harvesting, processing, or canning operations in the seafood industry were exempted from coverage of the act. The 1961 amendments severely limited the exemption and has resulted in coverage for minimum wages only, of some employees who have never before earned as much as the minimum wage. This has caused a severe hardship in some of the smaller operations in the industry. Sen. Thurmond inserted in Congressional Record, Oct. 19, 1965 (p. 26344), an article: "North Carolina: Minimum Wage Blamed For Industry Failure."

**SUPPLEMENTAL APPROPRIATIONS FOR FY 1966:** Hearings before Subcommittees of the Committee on Appropriations, United States Senate, 89th Congress, 1st session, 1,167 pp., printed. Under the Department of State includes funds to replace facilities of the International Pacific Halibut Commission on or near the campus of the University of Washington, Seattle. In exchange for a grant of \$500,000, the University will provide 12,000 square feet of space in their new Oceanography Building, and will supply heat, light, janitor service for 40 years; after that time contract will be renegotiated.

H. Rept. 1162, Supplemental Appropriation Bill 1966 (Oct. 13, 1965, report from the Committee on Appropriations, House of Representatives, 89th Congress, 1st session, to accompany H. R. 11588), 55 pp., printed. Committee reported favorably with various amendments.

H. R. 11588 (Mahon) introduced in House Oct. 13, 1965. Reported (H. Rept. 1162) from Committee on Appropriations Oct. 13; passed House Oct. 14. Reported (S. Rept. 912) in Senate Oct. 19, by Committee on Appropriations; Senate Oct. 20, 1965, passed with amendment (motion to reconsider tabled) H. R. 11588, accepting a number of Committee amendments, including one which provides \$500,000 for office and other facilities for the North Pacific Halibut Commission. Senate insisted on its amendments, asked for conference with House, and appointed conferees. Same day House disagreed to Senate amendments, agreed to conference requested by Senate, and appointed conferees.

The conferees Oct. 21, 1965, agreed to file a conference report (H. Rept. 1198) on the differences between the Senate- and House-passed versions of H. R. 11588. On the same day the report was filed in the House and the Senate. After the House receded from its disagreement to and concurred with Senate amendment 70 (regarding the Halibut Commission facilities funds), it adopted the conference report and sent the legislation to the Senate. The Senate also adopted the conference report and cleared the bill for the President's signature. H. R. 11588 was signed by the President Oct. 31, 1965 (P. L. 89-309).

**VESSEL "GONE FISHIN IV":** H. R. 11589 (Fascell) introduced in House Oct. 13, 1965, to permit the vessel Gone Fishin IV to be documented for use in the fisheries and coastwise trade; to Committee on Merchant Marine and Fisheries.





## FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON, D. C. 20402. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.  
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.  
SL - STATISTICAL LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.  
SSR - FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

- | Number   | Title  |
|----------|--|
| CFS-3776 | - Packaged Fishery Products, 1964 (Revised), 5 pp.   |
| CFS-3829 | - Massachusetts Landings (by Gear and Sub-area), 1964 Annual Summary, 16 pp.                             |
| CFS-3860 | - Gulf Coast Shrimp Data, January 1965, 15 pp.   |
| CFS-3871 | - New York Landings, May 1965, 5 pp.   |
| CFS-3874 | - Maryland Landings, May 1965, 4 pp.   |
| CFS-3876 | - Michigan, Ohio & Wisconsin Landings, April 1965, 4 pp.   |
| CFS-3877 | - Michigan, Ohio & Wisconsin Landings, May 1965, 4 pp.   |
| CFS-3883 | - South Carolina Landings, June 1965, 3 pp.  |
| CFS-3884 | - New Jersey Landings, June 1965, 3 pp.  |
| CFS-3886 | - Maine Landings, June 1965, 4 pp.   |
| CFS-3887 | - California Landings, April 1965, 4 pp.   |
| CFS-3888 | - California Landings, May 1965, 4 pp.   |
| CFS-3891 | - Shrimp Landings, February 1965, 5 pp.  |
| CFS-3892 | - Gulf Coast Shrimp Data, February 1965, 15 pp.  |
| CFS-3893 | - Alabama Landings, June 1965, 3 pp.   |
| CFS-3894 | - Texas Landings, April 1965, 2 pp.  |
| CFS-3895 | - New York Landings, June 1965, 4 pp.  |
| CFS-3896 | - Rhode Island Landings, April 1965, 3 pp.   |
| CFS-3898 | - Mississippi Landings, April 1965, 3 pp.  |
| CFS-3906 | - Florida Landings, July 1965, 8 pp.   |
| CFS-3907 | - Louisiana Landings, June 1965, 3 pp.   |
| CFS-3909 | - California Landings, June 1965, 4 pp.  |
| CFS-3914 | - Mississippi Landings, May 1965, 2 pp.  |
| SL- 36   | - Wholesale Dealers in Fishery Products, Iowa (Mississippi River and Tributaries), 1964 (Revised), 2 pp. |
| SL-116   | - Firms Canning Food for Animals, from Marine-Animal Products, 1964 (Revised), 4 pp.                     |
| SL-102   | - Firms Canning Maine Sardines, 1964 (Revised), 1 pp.  |

Sep. No. 744 - Distribution, Abundance, and Size of Sablefish (*Anoplopoma fimbria*) Found in Deep Water Off the Mouth of the Columbia River.

Sep. No. 745 - Shrimp Potential of the Eastern Gulf of Guinea.

SSR-Fish. No. 513 - Comparison of Vertebral Counts of Atlantic Menhaden, by Fred C. June, 14 pp., illus., June 1965.

Annual Report of the Bureau of Commercial Fisheries Biological Laboratory, Beaufort, N. C., for the Fiscal Year Ending June 30, 1964, Circular 215, 29 pp., illus., June 1965. Summarizes the research work carried out by the laboratory during Fiscal Year 1964, including blue crab, menhaden, shad, and Atlantic Coast striped bass programs.

The Big Bite--Commercial Fisheries of the Middle Atlantic Coast, Conservation Note 17, 8 pp., illus., Feb. 1965. Although the number of Middle Atlantic Coast fishermen (27,000-28,000 recently) has not changed much since the 1930's, landings have nearly doubled in size and have increased fivefold in value in that time. In a recent year, the catch of fish and shellfish totaled more than 1.5 billion pounds, worth nearly \$60 million to the fishermen, according to this leaflet. Included is information on the economic value of shellfish (oysters, clams, scallops, blue crab, and northern lobster); finfish fisheries--for porgy, alewives, flounders, striped bass, shad, butterfish, whiting, sea bass, and cod; and the new fisheries for tuna and swordfish.

Characteristics of Fish Populations in Upper Mississippi River Backwater Areas, by Lyle M. Christenson and Lloyd L. Smith, Circular 212, 56 pp., illus., March 1965.

Effects of Pesticides on Fish and Wildlife--1964 Research Findings of the Fish and Wildlife Service, Circular 226, 83 pp., Aug. 1965.

A Fisherman Looks at Reservoirs, by Charles E. Most, Circular 227, 16 pp., illus., June 1965.

Pesticide-Wildlife Studies by States, Provinces, and Universities, An Annotated List of Investigations Through 1964, Circular 224, 31 pp., May 1965.

Report of the Bureau of Commercial Fisheries for the Calendar Year 1963, 115 pp., illus., printed, 1965. From 1950 through 1962 the United States domestic catch of food fish was gradually declining and her imports growing to over a hundred percent. In 1963,

however, while the imports of food fish decreased, the percentage of the total supply of edible fishery products derived from imports remained about the same. As the population increases the total consumption of fishery products increases, and unless the United States is to become more and more dependent on foreign nations for fishery products, the domestic catch must be increased. This can and must be achieved by assisting the domestic fishing industry. The report touches on developments in 1963 in the domestic fisheries, Federal legislation affecting the industry, and international fishery matters. It also discusses principal Bureau accomplishments in the North Pacific, California, Hawaii, Gulf of Mexico, Atlantic Coast, and Great Lakes regions; research and development programs in foreign fishing explorations, international oceanographic expeditions, fish protein concentrate, new products from fish oil, irradiation of fishery products, effects of pesticides on fisheries, U. S. standards for fishery products and certification service, transportation facilities, shrimp futures on Chicago Mercantile Exchange, canned tuna promotion program, and others; financial assistance programs; work of the American Fisheries Advisory Committee; and cooperation and coordination with International, Federal, State, and other agencies. Included are discussions of the organization, employment, budget, and physical property of the Bureau; and a listing of publications written by its employees. Appendixes contain statistics of United States fisheries; organizations with which the Bureau had research and development contracts; and data on the Fisheries Loan Fund.

Treatment Tips: How to Determine Quantities for Chemical Treatments in Fish Farming, Circular 209, 16 pp., July 1965.

PUBLICATIONS AVAILABLE FREE FROM THE BRANCH OF STATISTICS,  
U. S. BUREAU OF COMMERCIAL FISHERIES, RM. 505, 1815 N. FORT MYER  
DR., ARLINGTON, VA. 22209.

Number	Title
CFS-3902 (HS No. 1) -	Imports of Fish Meal and Scrap, 1937-1964, 6 pp.
CFS-3903 (HS No. 2) -	U. S. Fish Meal and Scrap Production, 1929-1964, 5 pp.
CFS-3904 (HS No. 3) -	Foreign Trade in Fish and Marine-Animal Oils, 1925-1964, 10 pp.
CFS-3905 (HS No. 4) -	Menhaden Fishery, 1873-1964, 7 pp.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, August 1965, 15 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif. 90731.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; prices for fish meal, oil, and solubles; for the month indicated

California Fishery Market News Monthly Summary, Part II - Fishing Information, August 1965, 9 pp.,

illus. (U. S. Bureau of Commercial Fisheries, Tuna Resources Laboratory, P. O. Box 271, La Jolla, Calif. 92038.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the month indicated.

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, July and August 1965, 9 pp. each. (Market News Service, U. S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans, La. 70130.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; Gulf menhaden landings and production of meal, oil, and solubles; fishery imports at Mobile, Ala., Morgan City and New Orleans, La., Miami, Fla., and Houston, Port Isabel, and Brownsville, Tex., from Mexico; and sponge sales; for the months indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, August 1965, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va. 23369.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New England Fisheries--Monthly Summary, July and August 1965, 21 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston, Mass. 02210.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, and Provincetown), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the month indicated.

Receipts of Fresh and Frozen Fishery Products, New York City's Wholesale Fulton Fish Market, by Transport Method, 1938-1964, 4 pp., 1965. (Market News Service, U. S. Fish and Wildlife Service, 346 Broadway, New York, N. Y. 10013.)

Research Leads to Improved Harvesting-Processing-Marketing of Commercial Farm Pond Fish, Newsletter to Industry, 15 pp., illus., processed, Aug. 16, 1965. (Regional Office, U. S. Bureau of Commercial Fisheries, 5 Research Dr., Ann Arbor, Mich. 48103.) Discusses in detail results of research projects to assist farm pond fish producers: (1) final testing of a method for seining such fish as buffalofish and catfish from ponds up to 2,000 feet wide filled with water up to 8 feet deep; (2) successful handling of live catfish with a mechanical conveyor; (3) additional storage testing of buffalofish and catfish products; (4) a unique method for making a marketable product out of processing wastes and rough fish; (5) continuation of consumer education and market development activ-



ities such as fish cookery demonstrations and distribution of fish recipes to food editors; and (6) compilation of a list of live-fish dealers and consumers.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, August 1965, 9 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Bldg., 909 First Ave., Seattle, Wash. 98104.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl vessels reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

Selected Species of Fresh-Water Fish of the Chicago Market, compiled and edited by C. E. Cope, 12 pp., illus., Sept. 1965. (Fishery Market News Service, U. S. Bureau of Commercial Fisheries, 610 S. Canal St., Chicago, Ill. 60607.)

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. 20402.

Bibliography on Reservoir Fishery Biology in North America, by Robert M. Jenkins, Research Report 68, 61 pp., printed, 1965, 40 cents.

Bulrushes and Bulrushlike Plants of Eastern North America, by Neil Hotchkiss, Circular 221, 21 pp., illus., processed, May 1965, 20 cents.

Distribution of Alaskan Mammals, by Richard H. Manville and Stanley P. Young, Circular 211, 77 pp., illus., printed, 1965, 50 cents. Among the mammals described and in some cases, illustrated (including maps showing their range) are cetaceans--whales and porpoises; pinnipeds--sea lions and several species of seals; and the river and sea otters.

## MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

### ABALONE:

"El abulón Californiano" (The California abalone), by Keith W. Cox, article, *Pesca y Marina*, vol. 17, no. 4, Aug.-Sept. 1965, pp. 4, 6-11, illus., printed in Spanish. Fernando Flores Limitada, 705 N. Windsor Blvd., Los Angeles 38, Calif.

### AFRICA:

Market Profiles for Africa, OBR 65-43, 40 pp., printed, June 1965, 15 cents. Bureau of International Com-

merce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

### ANCHOVIES:

"Izmenenie razmerov ikry khamisy (*Engraulis encrasicolus ponticus* Alex.) v techenie nerestovogo sezona" (Variation in size of eggs of Black Sea anchovies, *Engraulis encrasicolus ponticus* Alex., during the spawning season), by T. V. Lugovaya, article, *Trudy Sevastopol'skoi Biol. Sta. Akad. Nauk Ukr. SSR*, vol. 16, 1963, pp. 364-388, printed in Russian. *Trudy Sevastopol'skaia Biologicheskaja Stautsiia, Akademiia Nauk SSSR, Leningrad, U.S.S.R.*

### ANTARCTIC:

Antarctic Research Series, Volume 1--Biology of the Antarctic Seas, edited by Milton O. Lee, Publication No. 1190, 196 pp., illus., printed, 1964, \$10. American Geophysical Union, Suite 506, 1145 19th St. NW., Washington, D. C. 20036. The first volume in the Antarctic Series deals with a number of marine studies. (Papers included in this series are original contributions too lengthy or otherwise unsuitable for publication in standard scientific journals. The material will be directed not only to scientists actively engaged in research work but to graduate students and scientists in closely related fields as well. The books in the series will serve both as references for the specialist and as sources of information for anyone acquainted with the biological and physical sciences.) This volume contains papers on: "Primary organic production in the Drake Passage and Bransfield Strait," by Sayed Z. El-Sayed, Enrique F. Mandelli, and Yukio Sugimura; "Primary productivity under sea ice in Antarctic waters. 1--Concentrations and photosynthetic activities of microalgae in the waters of McMurdo Sound, Antarctica; 2--Influence of light and other factors on photosynthetic activities of Antarctic marine microalgae," by J. S. Bunt; and "Respiratory metabolism and ecological characteristics of some fishes in McMurdo Sound, Antarctica," by Donald E. Wohlschlag. Also included are: "Temperature responses and tissue respiration in Antarctic crustacea with particular reference to the krill *Euphausia superba*," by M. A. McWhinnie; "Antarctic foraminiferal zonation," by Orville L. Bandy and Ronald J. Echols; and "Improved techniques for benthic trawling at depths greater than 2,000 meters," by Robert J. Menzies. An appendix consists of a catalogue and bibliography of Antarctic and Sub-Antarctic benthic marine algae.

### ARCTIC:

"Arctic Biological Station," by Mark Ronayne, article, *Trade News*, vol. 18, no. 1, July 1965, pp. 22-24, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada.

### ARGENTINA:

Following are from the series Contribucion del Instituto de Biologia Marina, printed in Spanish. Instituto de Biologia Marina, Mar del Plata, Argentina.

Algunos Datos sobre la Biologia de la Anchoita del Sector Bonacrense (Resultados Preliminares) (Some Data on the Biology of the Anchovy of the Bonacrense Area--Preliminary Results), by Maria Luisa Fuster de Plaza, No. 22, 1964.



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Los Recursos Pesqueros en America Latina (Summary) (The Fishery Resources in Latin America--Summary), No. 23, 1964.

Resultados Preliminares de las Campanas de Pesca Exploratoria de Langostines y Camarones en Rawson, 1962-1963 (Preliminary Results of the Exploratory Fishing Cruises for "Langostines" and Shrimp at Rawson, 1962-63), by Enrique Beschi, No. 21, 1964.

Variaciones Estacionales de la Fauna Ictica del Area de Pesca de Mar del Plata (Seasonal Variations in the Marine Fauna of the Fishing Area of Mar del Plata), by Alberto Nani, No. 24, 1964.

#### ASIA:

Market Profiles for the Near East and South Asia, OBR 65-37, 20 pp., printed, June 1965, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

#### AUSTRALIA:

Australian Journal of Marine and Freshwater Research, vol. 16, no. 2, July 1965, 126 pp., illus., printed, single copy 10s. (about US\$1.40). Editorial and Publications Section, CSIRO, Sixth Floor, 372 Albert St., East Melbourne C2, Australia. A few of the articles are: "Studies on the physiology of a shrimp *Metapenaeus* sp. (Crustacea: Decapoda: Penaeidae). IV--Carbohydrate metabolism; V--Calcium metabolism," by W. Dall; and "The ecology of six species of littoral gastropod molluscs. II--Seasonal variations in the six populations," by A. K. O'Gower and G. R. Meyer.

Australian Seafoods Buyer's Guide, 1965, 16 pp., illus., printed, 1965. Trade Publicity Branch, Department of Trade and Industry, Melbourne, Australia. An outstandingly attractive booklet designed for overseas importers of Australian spiny lobster, shrimp, abalone, oysters, scallops, and tuna. A full-color illustration of each species, together with a short explanation of landings, seasonal supplies, grading and packaging, and export requirements, is provided. Information on Australian export control regulations, current export markets, and worldwide Australian trade commissioner posts is also included.

#### AUSTRIA:

Market Factors in Austria, by John A. Cantwell and Elroy B. Thiel, OBR 65-51, 12 pp., printed, July 1965, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

#### BIOLOGIST:

Fishery Biologist and Wildlife Biologist, Announcement No. 285B, 12 pp., printed, revised April 1964. Board of Civil Service Examiners, Fish and Wildlife Service, U. S. Department of the Interior, Washington, D. C. 20240. A brochure on positions for fishery and wildlife biologists in the U. S. Fish and Wildlife Service. Covers location of positions, description of work, minimum education requirements, special provisions for satisfying basic educational

requirement, combination of superior academic achievement and subsequent professional experience, general and special requirements, general information, and how to apply for a position.

#### BLACK SEA:

Ryby Chernogo Morya (Fishes of the Black Sea), by A. N. Svetovidov, 551 pp., illus., printed in Russian, 1964, 3 Rubles, 30 Kop. (about US\$3.65). Nauka, Moscow, U.S.S.R.

#### BOTULISM:

Botulism and Fishery Products, by J. M. Shewan and D. C. Cann, Torry Advisory Note No. 22, 7 pp., printed, May 1965. Torry Research Station, 135 Aberdeen Rd., Aberdeen, Scotland.

#### BRAZIL:

Pesca, Estrutura e Producao, 1963 (Fishing Industry, Composition and Production, 1963), 37 pp., processed in Portuguese, March 1965. Servico de Estatistica da Producao, Departamento Economico, Ministerio da Agricultura, Rio de Janeiro, Brazil. Contains statistical tables showing number of fishermen, fishery products landings by type of gear, quantity and value of fish landings by class, and other data for 1962/63.

Revista Nacional da Pesca, vol. 6, no. 42, May-June 1965, 32 pp., illus., printed in Portuguese. Revista Nacional da Pesca, Av. Ipiranga, 890, 8º Andar, Sao Paulo, Brazil. Two of the articles are: "Panorama da pesca em Santa Catarina" (View of the fishery in Santa Catarina), by E. Tremel; and "Petróleo no conteúdo estomacal da sardinha" (Petroleum in the stomach contents of the sardine), by M. Nino de Moraes.

SUDENE--Boletim de Estudos de Pesca, vol. 4, no. 2, March-April 1964, 16 pp., printed in Portuguese. Grupo Coordenador do Desenvolvimento da Pesca (GCDP), SUDENE, Edif. Entrepoto Federal de Pesca, Cais de Santa Rita, 8º Andar, Recife, Pernambuco, Brazil. Two of the articles are: "Artesanato de pesca no Nordeste" (Technique of fishery in the Northeast); and "A pesca em Pernambuco, Parte I" (The fishery in Pernambuco, Part I), by Osiris Lira.

#### CANADA:

Journal of the Fisheries Research Board of Canada, vol. 22, no. 4, July 1965, 232 pp., illus., printed, single copy C\$2.25. Queen's Printer, Ottawa, Canada. "Ketone bodies in the blood of salmonoid fishes," by R. E. E. Jonas and E. Bilinski; "Sedimentation in a salmon stream," by S. Philip Shapley and Daniel M. Bishop; "Rancidity in lean fish muscle. IV--Effect of sodium chloride and other salts," by C.H. Castell, Jill MacLean, and Barbara Moore; "Estimates of the theoretical biomass of juvenile winter flounder, *Pseudopleuronectes americanus* (Walbaum), required for a fishery in Rhode Island," by Saul B. Salla, Donald B. Horton, and Richard J. Berry; "Partial freezing as a means of preserving Pacific salmon intended for canning," by N. Tomlinson and others; "Records of mollusca from the Northwest Atlantic obtained by Canadian fishery research vessels, 1946-61," by J. A. Allen; "Movements of hatchery-reared lake trout in Lake Superior," by Richard L. Pycha, William R. Dryer, and George R. King; "Time-lapse photography of an ASDIC echo-sounder PPI-scope as a technique for recording fish movements during migration," by

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

C. Groot and W. L. Wiley; "The role of behavior in the ecology and interaction of underyearling coho salmon (*Oncorhynchus kisutch*) and steelhead trout (*Salmo gairdneri*)," by G. F. Hartman; "Preliminary results on the seasonal size distribution of *Mytilicola orientalis* and the effect of this parasite on the condition of the Pacific oyster, *Crassostrea gigas*," by K. K. Chew, A. K. Sparks, and S. C. Katkanský; and "Predation on Lobsters (*Homarus americanus*) by *Anonyx* sp. (Crustacea, Amphipoda)," by D. J. Scarratt.

#### CASPIAN SEA:

"Vosproizvodstvo rybnikh zapasov Kaspiya v svyazi s gidrostraitel'stvom" (Propagation of the fish stocks in the Caspian, in connection with hydroelectric construction), by N. I. Kozhin, article, *Trudy Okeanog. Komissii Akad. Nauk SSSR*, vol. 5, 1959 pp. 251-256, printed in Russian. *Trudy Okeanograficheskoi Komissii, Akademiia Nauk SSSR*, Moscow, U.S.S.R.

#### CATFISH:

"Age and growth studies of channel catfish in western Lake Erie," by Gerardo C. De Roth, article, *The Journal of Wildlife Management*, vol. 29, no. 2, 1964, pp. 280-386, printed. Wildlife Society, 2000 P St. NW., Washington, D. C.

#### CAVIAR:

"Crisis in the caviare trade," article, *Australian Fisheries Newsletter*, vol. 24, no. 8, Aug. 1965, p. 31, printed. Fisheries Branch, Department of Primary Industry, Canberra A.C.T., Australia. Describes some of the problems of Soviet caviar producers--poor quality and declining production. Faced with an ever-growing shortage of this gourmet food, the Russians have resorted to sturgeon farming, particularly at Sevruga. There, in enclosed lagoons on the Caspian Sea, the fish farmers are planting the fertilized sturgeon eggs and rearing the fry to considerable size before they are liberated into the Sea. The operation has resulted in stabilizing production from year to year.

#### CLAMS:

"The economics of dredging quahogs in Rhode Island," by Andreas A. Holmsen, article, *Maritimes*, vol. 9, no. 3, Summer 1965, pp. 10-13, illus., printed. Graduate School of Oceanography, University of Rhode Island, Kingston, R. I. 02881.

#### COD:

"Artificial propagation of cod," by Gunnar Dannevig, article, *Fiskeridirektoratets Skrifter, Serie Havundersøkelser*, vol. 13, no. 6, 1963, pp. 73-79, illus., printed in Norwegian. Fiskeridirektoratet, Bergen, Norway.

"Blood properties of aquatic vertebrates. I--Total blood volume of the Atlantic cod, *Gadus morhua* L.," by K. Ronald and others, article, *Canadian Journal of Zoology*, vol. 42, no. 6, 1964, pp. 1127-1132, printed. Division of Administration, National Research Council, Sussex St., Ottawa 52, Canada.

"Changes in the Southern Gulf of St. Lawrence cod fishery," by A. C. Kohler, article, *Trade News*, vol. 18, no. 1, July 1965, pp. 14-15, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada.

"Industria da pesca do bacalhau" (Cod fishing industry), article, *Jornal do Pescador*, vol. 27, no. 319, Aug. 1965, pp. 17-19, printed in Portuguese, single copy 5 escudos (about US\$0.20). Casas dos Pescadores, R do S. Bento, 644, 2<sup>o</sup>, Lisbon, Portugal.

"Parasites of young cod in the Barents Sea" (O parazitofaune molodi treski v Barentsevom more.), by Yu. I. Polyanskii and I. V. Kulemina, article, *Biological Abstracts*, vol. 45, no. 11, 1964, Abstract No. 45261, printed. Biological Abstracts, 3815 Walnut St., Philadelphia 4, Pa.

"Protein denaturation in frozen fish. X--Changes in cod muscle in the unfrozen state, with some further observations on the principles underlying the cell fragility method," by R. M. Love and others, article, *Journal of the Science of Food and Agriculture*, vol. 16, May 1965, pp. 259-267, printed, single copy £1 17s. 6d. (about US\$5.25). Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

"Utkast av torsk fra tralfangster" (Rejection of cod from trawler landings), by Arvid Hylen, article, *Fiskets Gang*, vol. 51, no. 30, July 29, 1965, pp. 433-435, illus., printed in Norwegian with English abstract. Fiskets Gang, Fiskeridirektoratet, Radstuplass 10, Bergen, Norway.

Reprints from *Zeitschrift für Fischerei und deren Hilfswissenschaften*, vol. 11, 1962-63, printed in German with Russian and English summaries. Neumann Verlag, 19 Dr. Schmincke Allee, Radebeul 1, Germany.

"Beobachtungen an einer Kiemenbogengeschwulst, einer Leibeshohlencyste und Eingeweideverwachsungen beim Ostseedorsch (*Gadus morhua* L.)" (Observations on a Gill-Arch Tumor, a Body Cavity Cyst, and Intestinal Growths of the Baltic Sea Cod), by Meinhild Berner, 8 pp., illus. (from no. 3/4, pp. 175-182).

"Ergebnisse der Markierungsexperimente am Ostseedorsch (*Gadus morhua* L.) in der Bornholm- und Arkonasee 1959" (Results of Marine Experiments on Baltic Sea Cod in the Bornholm and Arkona Seas 1959), by Meinhild Berner, 10 pp., illus. (from no. 5/6, pp. 453-462).

#### CONSERVATION:

*Federal Aid in Fish and Wildlife Restoration (Annual Report on Dingell-Johnson and Pittman-Robertson Programs for the Fiscal Year Ending June 30, 1964)*, 92 pp., illus., printed, 1965. Sport Fishing Institute, Bond Bldg., Washington, D. C. 20005. Presents a short program review of expenditures and projects (including sport fish restoration) operated during FY 1964, and statistical tables on individual conservation projects, land purchases, hunting and fishing licenses issued by the states, and other related data.

#### CONSUMER EDUCATION:

Processed informative leaflets available from the Agricultural Extension Service, Washington State University, Pullman, Wash. 99163.

*Washington Fresh Seafood Calendar*, E.M. 2507, 1 p., Feb. 1965.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

When You Buy Food--the Meat Group (Meat, Poultry, Fish . . .), E.M. 2495, 2 pp., Feb. 1965.

When You Buy Seafood, E.M. 2510, 3 pp., illus., March 1965.

#### CUBA:

Las Pesquerias de Cuba y Algunas Recomendaciones para su Intensificación (The Fisheries of Cuba and Some Recommendations for Their Improvement), by Hermann Ritzhaupt, Contribucion No. 21, 110 pp., illus., printed in Spanish, Feb. 1965. Centro de Investigaciones Pesqueras, Instituto Nacional de la Pesca, Havana, Cuba.

#### CZECHOSLOVAKIA:

Buletin VUR Vodnany, vol. 1, no. 1, Jan.-March 1965, 39 pp., illus., printed in Czechoslovak with English table of contents and abstracts. Fisheries Research Institute, Vodnany, Czechoslovakia. The first issue of a new quarterly concerned with the fresh-water fisheries of Eastern Europe. Some of the articles are: "The tasks of Fisheries Research Institute Vodnany," by J. Tvřický; "The tasks of the State Fisheries in the coming years," by J. Tesářík; "Prospects of the liquidation of the most important diseases of fish in fish-ponds under the conditions of Czechoslovakia," by M. Vejvoda; "A portable electric apparatus for the catching of fish," by V. Janeczek and F. Reiser; "Report from the Symposium on Freshwater Fishery in Yugoslavia"; and "The latest completed research tasks of the Fisheries Research Institute Vodnany."

#### DENMARK:

Fiskeriberetning for Året 1964 (The Ministry of Fisheries Annual Report for 1964), 134 pp., illus., printed in Danish with English summary, August 1965, Kr. 7.50 (about US\$1.10). Fiskeriministeriet, 1 Kommission Hos, G.E.C. Gad, Copenhagen, Denmark. Contains reports and statistical tables on fishermen, fishing craft and gear; landings from marine-waters--including cost of supplies and gear; catch in lakes, rivers, and ponds--including fish culture data; processed fish--catch and export data for more than 30 food fish are given; and domestic consumption, exports, and imports of fishery products. Also includes information on organization of the Fisheries Ministry and on legislation pertaining to fisheries.

#### EAST AFRICA:

"Joint venture in fishing industry," article, Spear, vol. 7, no. 3, June 1965, pp. 62-64, illus., printed. East African Railways and Harbours, Nairobi, Kenya. An agreement signed in April 1965 in Dar es Salaam established for the first time a Tanzanian-Japanese commercial venture in the fishing industry. Its objective is the promotion and development of the hitherto nearly untouched fisheries and so increase the production of valuable protein foods for local consumption from Indian Ocean waters off the East African Coast. The company has a fleet of 9 vessels--a 50-ton refrigerated mothership-trawler, a 30-ton refrigerated stern trawler, two 5-ton stern trawlers, and five 21-foot open fishing boats. Two of the boats are used for training African fishermen. With a capital investment of £100,000 (about US\$279,000), the new joint venture company plans to convert the facilities of a sister company into a modern fish-

processing plant. Also projected is the establishment of a tunabase with the construction of a pier capable of handling oceangoing vessels. An adjacent cold-storage plant will have a capacity of 2,000 tons of fish.

#### EEL:

"Quest for the true breeding area of the American eel (*Anguilla rostrata* LeSueur)," by Vadim D. Vladkov, article, Journal of the Fisheries Research Board of Canada, vol. 21, no. 6, 1964, pp. 1523-1530, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

#### ELECTRICAL FISHING:

"Fish better - electrically," by Murray G. Johnson, article, Ontario Fish & Wildlife Review, vol. 3, no. 1, 1964, pp. 9-12, printed. Department of Lands and Forests, Parliament Bldg., Toronto 5, Canada.

"K voprosu 'vidovoi' chuvstvitel'nosti ryb k elektricheskomu toku" ("Specific" sensitivity of fish to electric current), by N. V. Bodrova and B. V. Kryaukhin, article, Byul. Inst. Biol. Vodokhran. Akad. Nauk SSSR, vol. 5, 1959, pp. 26-31, printed in Russian. Akademiia Nauk SSSR, Moscow, U.S.S.R.

#### ESTUARINE FISH:

"Some effects of a synthetic detergent on estuarine fishes," by Ronald Eisler, article, Transactions of the American Fisheries Society, vol. 94, no. 1, 1965, pp. 26-31, printed. American Fisheries Society, 1404 New York Ave. NW., Washington, D. C. 20005.

#### FISH BEHAVIOR:

"A study of fish behavior in an electric field" (Issledovanie povedeniya ryby v elektricheskom pole), by L. M. Nusenbaum and T. I. Faleeva, article, Biological Abstracts, vol. 45, no. 13, 1964, Abstract No. 54199, printed. Biological Abstracts, 3815 Walnut St., Philadelphia 4, Pa.

#### FISH DISEASES:

"Studies on the diseases of marine-culture fishes. I--General description and preliminary discussion of fish diseases at Mie Prefecture; II--Pharmacodynamic effects of nitrofurazone for fish diseases (1)," by Saburoh S. Kubota and others, articles, Journal of the Faculty of Fisheries, vol. 6, no. 1, 1963, pp. 107-144, illus., printed. Journal of the Faculty of Fisheries, Prefectural University of Mie, Tsu, Japan.

#### FISHERIES RESEARCH:

Research in Fisheries, 1964, Contribution no. 184, 73 pp., printed, 1965. University of Washington, Fisheries Research Institute, Seattle, Wash. 98105.

#### FISHERY AGREEMENT:

Japan-Republic of South Korea Fisheries Agreement, 62 pp., printed in Japanese, 1965. Government of Japan, Tokyo, Japan.

#### FISH FINDER:

"Fish finding by automatic unmanned devices," article, World Fishing, vol. 14, no. 8, Aug. 1965, pp. 39-40, printed, single copy 3s. 6d. (about US\$0.55). Gramplan Press Ltd., The Tower, 229-243 Shepherd's Bush Rd., Hammersmith, London W6, England.

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#### FISHING WITH LIGHTS:

"Results of the study of pelagic fish fauna in the Pacific and Indian Oceans by using electric lights to attract fishes," by N. V. Parin, article, Trudy Instituta Okeanologii, vol. 62, 1963, pp. 128-144, printed in Russian. Trudy Instituta Okeanologii Akademii Nauk SSSR, Izdatel'stvo Akademii Nauk SSSR, Moscow, U.S.S.R.

#### FISH MEAL:

"Feed value of fish meals," by Kuman Saruya and others, article, Chemical Abstracts, vol. 61, Sept. 14, 1964, Abstract No. 7622d, printed. The American Chemical Society, 1155 16th St. NW., Washington, D.C. 20005.

#### FISH OIL:

"Studies on the fish oils (from fish) caught in the Inland Sea of Japan. I--On the oils from Harengula zunasi, Saurida and halfbeak," by Seiichi Ueno and Shigeru Hamada, article, Journal of Japan Oil Chemists' Society, vol. 11, no. 10, 1963, pp. 526-532, printed. Japan Oil Chemists' Society, Department of Applied Chemistry, Faculty of Engineering, University of Tokyo, Motofujicho, Bunkyo-ku, Tokyo, Japan.

Available from The American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006:

"Neutralization of technical fish oil by anion-exchange resin EDE-10P and its regeneration," by K. M. Ol'shanova and G. V. Frolova, article, Chemical Abstracts, vol. 61, Aug. 17, 1964, Abstract No. 4603d, printed.

"Volatile acids from menhaden oil," by J. R. Chipault and E. McMeans, article, Journal of Agricultural and Food Chemistry, vol. 13, 1965, pp. 15-17, printed.

#### FISH POPULATIONS:

"Some further remarks on the methods of estimating fish populations" (Jeste k metode odhadu velikosti rybi osadky), by Ota Oliva, article, Biological Abstracts, vol. 45, no. 13, 1964, Abstract No. 54348, printed. Biological Abstracts, 3815 Walnut St., Philadelphia 4, Pa.

#### FISH PROTEIN CONCENTRATE:

"Shark meat flour," by Haq S. Abdul and S. Mahdhasan, article, Pakistan Journal of Scientific and Industrial Research, vol. 3, 1960, pp. 213-215, printed. Pakistan Council of Scientific and Industrial Research, 3/4/D/VI, Nazimabad, Karachi, Pakistan.

#### FISH STOCKS:

Contributions to Symposium, 1963, on the Measurement of Abundance of Fish Stocks, edited by J. A. Gulland, Rapports et Proces-Verbaux des Reunions, vol. 155, 223 pp., printed, 1964. International Council for the Exploration of the Sea (ICES), Charlottenlund-Slot, Denmark.

#### FOOD AND AGRICULTURE ORGANIZATION:

The Food and Agriculture Organization has published reports describing that Agency's activities under the Expanded Program for Technical Assistance for developing the fisheries of many countries. These

reports have been processed only for limited distribution to governments, libraries, and universities. Food and Agriculture Organization of the United Nations, via delle Terme di Caracalla, Rome, Italy.

Report to the Government of Nigeria on Investigations of Brackish-Water Fish Culture in the Niger Delta, by T. V. R. Pillay, FAO/EPTA Report No. 1973, 41 pp., processed, 1965.

Report of the FAO/IPFC Training Centre on Mackerel and Tuna Research, Cronulla, November 2-27, 1964, FAO/EPTA Report No. 1977, 11 pp., processed, 1965.

Report to the Government of Ghana on Biological Investigation of Fisheries Resources, by Miroslav Zei, FAO/EPTA Report No. 2001, 34 pp., processed, 1965.

#### FOOD CONSUMPTION:

U. S. Food Consumption, Sources of Data and Trends, 1909-63, Statistical Bulletin No. 364, 198 pp., illus., processed, June 1965. Economic Research Service, U. S. Department of Agriculture, Washington, D. C. 20250. Contains, among data on many other foods, statistical tables and explanations on per capita consumption (edible weight) of fishery products, 1909-63; and supply and utilization of commercial fishery products (edible weight), 1929-63.

#### FOOD PRESERVATION:

Food Preservation (Except by Irradiation), SB 412, Supp. 2, 15 pp., printed, Feb. 1965. Federal Clearinghouse for Federal Scientific and Technical Information, U. S. Department of Commerce, Braddock and Port Royal Sts., Springfield, Va. 22151.

#### FOOD PROCESSING:

Canned and Cured Seafood, SIC Code 2031, Industry Series, Preliminary Report, 1963 Census of Manufactures, 4 pp., processed, 10 cents. Bureau of the Census, U. S. Department of Commerce, Washington, D. C. 20233. Presents data on canned and cured seafood plants, employees, value added by manufacture, value of production, and general statistics. During 1963, processors of canned and cured seafoods produced products valued at \$452 million, an increase of 16 percent over 1958, according to preliminary results of the 1963 Census of Manufactures. Average employment in the industry showed an increase of 1 percent from 1958 to a total of 17,300 employees in 1963. Value added by manufacture amounted to \$175 million in 1963, an increase of 34 percent over 1958. The industry includes processors engaged in cooking and canning fish, shrimp, oysters, clams, crabs, and other fish and shellfish; and in smoking, salting, drying, and otherwise curing fishery products.

Food Processing Operations--Their Management, Machines, Materials, and Methods, Vol. 3, by Maynard A. Joslyn and J. L. Heid, 565 pp., illus., printed, 1964, domestic \$19.75, foreign \$20.75. The Avi Publishing Co., Inc., P. O. Box 388, Westport, Conn. The third and final volume of this series on food processing offers technical information on procurement, special ingredients, processing techniques, pumping, package engineering, and waste utilization and disposal. Some of the processing techniques featured are grinding, freezing, freeze-drying, vacuum concentration, and frying. Engineering aspects of heat transfer, freeze

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dehydration, and packaging are discussed in detail. The chapter on preservation by freezing discusses the handling of fish, among other foods, fish and shrimp--freezing methods and equipment; packaging; chemical changes in frozen foods; and the future of the frozen food industry. The chapter on processing aspects of freeze dehydration covers raw materials, preparation for freezing, effects of freezing conditions on freeze-dried products, effects of dehydration conditions on product quality, packaging of freeze-dried foods, storage, rehydration, and marketing. A short chapter on plant location and design reviews the dominant locative factors--raw materials and supplies, markets, transportation, labor, site environment, power and fuel, capital, and taxes; and considerations in plant design--site, buildings, and equipment. The final chapter points out what is needed for a food processing industry to succeed, among which are cooperation and teamwork in making best possible use of available resources. "Survival and growth depend upon the alertness, flexibility, judgment and actions of management in relation to changing conditions in raw materials, processes, products, markets, and competition," states the author. Each chapter has a complete bibliography, and the index for the book is quite adequate. Food technologists, food processors, or handlers of all types of food products will find this, as well as the first two volumes, to be a valuable handbook. (For reviews of vols. 1 and 2 see *Commercial Fisheries Review*, August 1963 p. 135; and May 1964 p.91.)

#### FRANCE:

"La pêche Française en Méditerranée" (The French fishery in the Mediterranean), by Claude Morin, article, *France Pêche*, no. 97, July-Aug. 1965, pp. 25-26, illus., printed in French, single copy 2.5 F. (about US\$0.50). *France Pêche*, Boite Postale 179, Lorient, France.

Articles from *La Pêche Maritime*, vol. 44, no. 1048, July 1965, printed in French, single copy 14 F. (about US\$2.85). Les Editions Maritimes, 190, Blvd. Haussmann, Paris, France:

"Conjoncture plutôt mauvaise au cours du premier semestre" (Rather bad situation during the first half-year), by L. Plouas, pp. 527, 529, 530.

"La production et la commercialisation des produits surgelés en 1964" (The production and marketing of frozen fishery products in 1964), pp. 555, 556.

#### FREEZE-DRYING:

"Freeze drying 12-fold increase by 1970," by Kermit Bird, article, *Food Processing*, vol. 26, March 1965, pp. 75-77, 92, printed. Putnam Publishing Company, 111 E. Delaware Pl., Chicago 11, Ill.

#### FREEZING ON BOARD:

"North American experience in chilling and freezing fish on board vessels," by Joseph W. Slavin and W. A. MacCallum, article, *Proceedings of the XI International Congress of Refrigeration*, vol. 11, 1964, pp. 931-940, printed. International Institute of Refrigeration, 177 blvd. Malesherbes, Paris (17<sup>e</sup>), France.

#### GERMAN FEDERAL REPUBLIC:

Baubeschreibung des Fischerei-Forschungsschiffes WALTHER HERWIG Erbaut bei der A. G. WESER,

Werk Seebeck (Construction Description of the Fishery Research Vessel Walther Herwig), 139 pp., processed in German, 1965. Der Bundesminister der Ernährung, Landwirtschaft und Forsten, Unterabteilung Fischwirtschaft, 2 Hamburg-Altona 1, Federal Republic of Germany.

"Det tyske fiskeri i 1964" (The German fishery in 1964), by Vagn Korsboek, article, *Fiskeribladet*, vol. 57, no. 5, Aug. 1965, pp. 73, 75, printed in Danish. W. Bamberger, Kobenhavns Fisketorv, Copenhagen V, Denmark.

#### EAST GERMANY:

*Deutsche Fischerei-Zeitung*, vol. 12, no. 7, July 1965, 32 pp., illus., printed in German. Deutsche Fischerei-Zeitung, Muggelseedamm 310, Berlin-Friedrichshagen, German Democratic Republic. Some of the articles are: "Methoden der Steigerung der teichfischproduktion in Israel" (Methods of increasing pond fish production in Israel), by F. Wolny; and "Neuerungen in der Zugnetzfischerei" (Innovations in the drag-net fishery), by E. Schlieker.

#### GREAT LAKES:

*Fishes of the Great Lakes Region*, by Carl L. Hubbs and Karl F. Lagler, 272 pp., illus., printed, revised edition 1964, \$6.95. The University of Michigan Press, Ann Arbor, Mich. Originally published in 1947, this book is a reprint of the 1958 edition with some corrections in the text and new material in the preface for 1964. The new preface includes revisions of some technical names of fishes and additions to the fish fauna of the Great Lakes through discovery and through intentional and inadvertent introduction. The opening sections discuss the waters of the Great Lakes region and their fish associations; zoogeography of the region; postglacial dispersal of fish; field study and the collecting of fish; their preservation for study; and identification of fish--anatomical features, and terms and methods of counting and measuring, and key to the families of Great Lakes fish. Most of the text is devoted to descriptions of the 29 families of Great Lakes fish, with keys to species and subspecies. Forty-four full-color plates and 251 black and white sketches add interest and clarity. A complete bibliography and an adequate index are included. This book will be useful to both sport and commercial fishermen, as well as to students of aquatic biology.

#### HAWAII:

*A Proposed Program for Hawaiian Fisheries*, by Vernon E. Brock, 18 pp., Technical Report Series No. 6, processed, 1965. Hawaii Marine Laboratory, University of Hawaii, Honolulu, Hawaii. Discusses the problem of the Hawaiian fisheries--a decline in the number of fishermen from 2,500 in the postwar period to fewer than 1,000 in 1960--caused by increases in operating costs, rises in incomes from competing occupations, and stabilization of fish prices. The solution of the dilemma must be found in a substantial reduction in the cost of catching fish, states the author. He then outlines the nature of the Hawaiian fishery resources: the oceanic fish--sharks, marlin, flyingfish, and tuna; minor fishery resources--inshore and bottomfish fisheries; and other possible fishery resources--culture of oysters, clams, and shrimp. The final section offers suggestions on what needs to be done by the Federal or State government to improve the Hawaiian fisheries.

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# HERRING:

Reprints from Zeitschrift für Fischerei und Deren Hilfswissenschaften, vol. 11, 1962-63, printed in German with Russian and English summaries. Neumann Verlag, 19 Dr. Schmincke Allee, Radebeul 1, Germany.

Die Fruchtbarkeit der Frühjahrs- und Herbstheringe aus den Gewässern um Rugen (The Fecundity of the Spring and Fall Herring from the Waters around Rugen Island), by Karl Anwand, 11 pp., illus. (from no. 5/6, pp. 463-473).

Vergleichende Untersuchungen an Frühjahrs- und Herbstheringen aus den Gewässern um Rugen (Comparative Investigations on Spring and Fall Herring from the Waters around Rugen Island), by Karl Anwand, 39 pp., illus. (from no. 3/4, pp. 211-249).

Das Wachstum der Frühjahrs- und Herbstheringe aus den Gewässern um Rugen (The Growth of Spring and Fall Herring from the Waters around Rugen Island), by K. Anwand, 9 pp., illus. (from no. 3/4, pp. 201-209).

# ICELAND:

Articles from Iceland Review, vol. 3, no. 2, 1965, single copy Kr. 65 (about US\$1.50). Iceland Review, P.O.B. 1238, Reykjavik, Iceland:

"Atlantic Fishing," pp. 59-60. Summarizes highlights of the Icelandic fisheries during 1964. Total Icelandic catch was 971,574 metric tons, an increase of 24 percent over 1963. The fishing fleet was expanded by 49 new vessels, bringing the gross tonnage total to 79,032, not including open motorboats. Cod landings totaled 273,607 tons, as compared with 206,281 tons the previous year. Total value of fishery products exports during 1964 was Kr. 4,384 million (about US\$102 million) compared with Kr. 3,727 million (about \$87 million) in 1963.

"Foreign fishing off Iceland," by David Olafsson, pp. 38-40. Describes the historical and current activities of foreign fishing vessels near Iceland. During the past 30 years, the British, Norwegian, and German vessels have predominated. Their combined catches have averaged more than 90 percent of the total landed by all foreign fishermen off Iceland.

# ICHTHYOLOGY:

Fishes and Their Ways, by Clarence J. Hylander, 256 pp., illus., printed, 1964, \$4.95. The Macmillan Co., Front & Brown Sts., Riverside, N. J. This is the final volume in the author's Young Naturalist Series. It is a book about the fish found in the streams and lakes of the United States and in the seas bordering its shores. The introductory chapter defines a fish and describes attributes common to all. Considerable detail is provided on the body design and covering of a fish, how it swims, fins and their uses, the colors and size of fish, where they live, and how they are classified. There follows a chapter dealing with how fish live--their feeding habits, how they adjust to their surroundings, how they protect themselves, their family life and migration. Succeeding chapters are devoted to different groups of fish: the freshwater game fish such as salmon, catfish, pike, sunfish, and perch; other freshwater fish--minnows, sticklebacks, sturgeon, and gar; and the salt-water

game fish--the sea bass, drum, snapper, porgy, mackerel, mullet, jack, and many others. Commercial marine fish including herring, smelt, cod, and flounder are described; followed by chapters about colorful tropical fish--the butterflyfish, grunt, filefish, and moray eels; strange sea creatures--pufferfish, sea robin, flyingfish, and pipefish; and the cartilaginous fish--lamprey, many families of shark, the skate, the stingray, and the manta. Included are a short but adequate bibliography and an index to common and scientific names of fish. Although intended as a textbook for Junior and Senior High School students, this book will be a useful addition to any general or home library.

# IMPORTS:

U. S. Imports for Consumption and General Imports, 1964 (Tariff Schedules Annotated by Country), 535 pp., processed, July 1965, \$2. Bureau of the Census, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Among all the other products are included quantity and value of fish and fishery products imported into the United States during calendar year 1964, by type and by country.

# INDIA:

Establishing a Business in India, by Celia Herman, OBR 65-48, 20 pp., printed, July 1965, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

# INDUSTRIAL PRODUCTS:

"Production of fish oil and fish meal," by R. R. Brenner, article, Chemical Abstracts, vol. 60, Feb. 17, 1964, Abstract No. 4698e, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

# INTERNATIONAL COMMISSIONS:

International Commission for the Northwest Atlantic Fisheries, Statistical Bulletin for the Year 1963, vol. 13, 87 pp., illus., printed, May 1965. International Commission for the Northwest Atlantic Fisheries, Bedford Institute of Oceanography, P. O. Box 638, Dartmouth, N. S., Canada. This bulletin is divided into two parts: Part 1 summarizes statistics on fishery landings from the Convention area, 1952-63; Part 2 includes statistical tables dealing with the fisheries in 1963. Included are data on landings by species, country, and geographical division; landings of principal species (cod, haddock, ocean perch, halibut, flounder, other groundfish, herring, and other pelagic fish) by month and division; landings by species and subarea; fishing effort and landings by division, month, gear, and country; and effort and landings by country, gear, and subarea. Member countries are Canada, Denmark, France, Germany, Iceland, Italy, Norway, Poland, Portugal, Spain, U.S.S.R., United Kingdom, and the United States.

North-East Atlantic Fisheries Commission, Report of the Third Meeting, May 1965, 47 pp., processed in French and English, 1965. North-East Atlantic Fisheries Commission, Rm. 617, East Block, Whitehall Pl., London SW1, England. Reports on the proceedings of the Third Meeting of the North-East Atlantic



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Fisheries Commission, in Moscow, May 11-14, 1965. Delegations attended from 13 of the 14 European member Governments; the United States Government, the Food and Agriculture Organization of the United Nations, the International Council for the Exploration of the Sea, and the International Commission for the Northwest Atlantic Fisheries sent observers. The Special Committee on International Control, established at the 1964 meeting, reported on its findings; the Commission then resolved that Contracting States should (within the limits of their respective jurisdictions) inspect foreign vessels to find out whether they have been complying with the Commission's recommendations on mesh size and other items, and report results of inspection to the Flag States and the Commission. The Commission also agreed that the Committee should continue its work during the coming year to determine the feasibility of introducing a system of international inspection on the high seas effective Jan. 1, 1967. Other resolutions were taken concerning minimum mesh size and top-side chafers in various parts of the Convention Area.

#### JAPAN:

Bulletin of the Hokkaido Regional Fisheries Research Laboratory, no. 29, Nov. 1964, 130 pp., illus., printed in Japanese with English abstracts. Hokkaido Regional Fisheries Research Laboratory, Yoichi, Hokkaido, Japan. Some of the articles are: "On the gill-net mesh selectivity curve. II," by T. Ishida; "The fishing condition of the squids, *Ommastrephes sloani pacificus* (Steenstrup), in the coastal area off Cape of Esan of the Hokkaido in autumn," by M. Kawasaki; "Larvae of decapod crustacea of Hokkaido. 5--Paguridae (anomura); 6--Lithodidae (anomura); 7--Porcellanidae (anomura); 8--Dorippidae (brachyura)," by H. Kurata; "Food and feeding habit of Pacific salmon (Genus *Oncorhynchus*) in their oceanic life," by J. Ito; "Studies on methods to prevent oxidative deterioration in saury meals," by K. Miwa and T. Tokunaga; and "Studies on the development of dimethylamine and formaldehyde in Alaska pollock muscle during frozen storage," by T. Tokunaga.

Available from Hokkaido Fisheries Experimental Station, 238 Banchi, Hamanaka-cho, Yoichi, Hokkaido, Japan.

Hokusuishi Geppo (Hokkaido Fisheries Experimental Station Monthly), vol. 22, no. 6, June 1965, 48 pp., printed in Japanese.

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Available from the Fisheries Agency, Ministry of Agriculture and Forestry, 2-1 Kasumigaseki, Chiyoda-ku, Tokyo, Japan.

Fisheries Agency's Budget Appropriation Requests by Items for Fiscal Year 1966 (April 1966-March 1967), 41 pp., printed in Japanese, July 1965.

Suisancho Shuho (Weekly Report of the Fisheries Agency), vol. 16, no. 11, July 1965, 109 pp., printed in Japanese.

Present State and Prospects of Agricultural and Fishery Products for Export, 1965 Annual, 347 pp.,

printed in Japanese, June 1965. JETRO, 1-banchi, 1-chome, Higashi Shinbashi, Minato-ku, Tokyo, Japan.

#### KOREA:

Annual Report for Fishery Products Inspection, 1964, 230 pp., illus., printed in Korean and English. Central Fisheries Inspection Station, Ministry of Agriculture and Forestry, 103 Wonnam-Dong, Chong-Ro, Seoul, Korea.

#### LAKE TROUT:

"The lake trout are back," by Walter R. Crowe, article, Michigan Conservation, July-Aug. 1965, vol. 34, no. 4, pp. 2-7, illus., printed. Michigan Conservation, Lansing, Mich. 48926. Explains how, with effective lamprey control, the lake trout populations in Lake Superior are being rehabilitated. Electrical barrier weirs and even more efficient lampriades applied to tributary streams have reduced the numbers of trout-destroying sea lampreys. In addition, starting in the late 1940's Michigan fisheries workers began collecting lake trout eggs for development as hatchery brood stock to accomplish eventual restocking of Lake Superior.

#### LATIN AMERICA:

Market Profiles for the American Republics, OBR 65-55, 24 pp., printed, July 1965, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

Market Indicators for Latin American Republics, by Selina Caldor and others, OBR 65-41, 28 pp., illus., printed, June 1965, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

#### LOBSTER:

About Lobsters, by T.M. Prudden, 172 pp., illus., printed, 1962, \$5. The Bond Wheelwright Co., Porter's Landing, Freeport, Maine. In simple, non-technical language, the author reviews all that is known about the lobster. A brief portrait of a lobsterman is followed by the introductory chapter on the nature of lobsters, history of the industry, sources of lobsters, effect of fresh water, habitat, migration, effect of water temperature on the catch, direct relation between increase in fishing effort and total catch, the lobster's senses, molting, breeding habits, food, enemies, diseases, and measuring a lobster. Next is a chapter on means of catching lobsters, care of pots, plugs and bands, buoys, trawling, and British methods of lobster fishing. Succeeding chapters discuss use of artificial bait; techniques for maintaining artificial sea water in inland tanks, including charts showing symptoms and probable causes of death of lobsters in recirculated holding systems, and the DO's and DO NOT's of profitable operation; tidal pounds; shipping of lobsters; preservation of lobster meat; and Pacific Coast transplanting and artificial rearing in hatcheries. The final chapters include information on marketing of lobsters; biological and gear research; and preparing and cooking. A short bibliography completes this book which will interest commercial and sport fishermen, dealers, processors, retailers, as well as the general reader.



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PE Triples Life of Lobster Traps, 2 pp., illus., printed. (Reprinted from *Modern Plastics*, Dec. 1964.) McGraw-Hill, Inc., 770 Lexington Ave., New York, N.Y. 10021. The switch from wooden cages to molded polyethylene "igloos" may help move Canada's East Coast lobster fisheries out of the marginal industry class.

#### MANATEE:

"El manati Africano" (The African manatee), by Aurelio Basilio, article, *Iberica*, vol. 43, no. 37-38, July-Aug. 1965, pp. 258-260, illus., printed in Spanish, single copy 30 ptas. (about US\$0.50). *Iberica*, Palau, 3, Apartado 759, Barcelona-2, Spain.

#### MARINE BIOLOGY:

The Biological Bulletin, vol. 129, no. 1, Aug. 1965, 216 pp., illus., printed, single copy \$3.75. The Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass. Two of the articles are: "Chromosomes of two species of quahog clams and their hybrids," by R. Winston Menzel and Margaret Y. Menzel; and "Growth and survival of postlarval *Penaeus aztecus* under controlled conditions of temperature and salinity," by Zoula P. Zein-Eldin and David V. Aldrich.

#### MARINE FARMING:

"Five acres of fish," by Ruth Halliday, article, *New Scientist*, vol. 27, no. 455, Aug. 5, 1965, pp. 330-331, illus., printed, single copy 1s. 3d. (about US\$0.20). Cromwell House, Fulwood Pl., High Holborn, London WC1, England. Explains how a small bay in western Argyllshire, Scotland, is now being converted into Britain's first experimental marine fish farm. A small inlet was enclosed by a dam and the first fish stocked in August 1965. The 5-acre pond could lead the way to great changes in the British marine fisheries if results of experimental work being done there under supervision of the White Fish Authority are encouraging. Operation of a farm will provide an opportunity to collect data on behavior and reaction of plaice, and to measure growth under different feeding regimes. The plaice is marketable when it reaches a length of about 25 cm. (about 9.8 inches), which takes 4-5 years in the sea. But with suitable feeding, temperature control, and breeding this length may be achieved in only 2 years in ponds.

#### MARKETING:

Comparative Costs to Consumers of Convenience Foods and Home-Prepared Foods, by Harry H. Harp and Denis F. Dunham, Marketing Research Report No. 609, 94 pp., illus., processed, June 1963. Marketing Economics Division, Economic Research Service, U. S. Department of Agriculture, Washington, D. C. 20250. This comprehensive report contains cost and yield data for 247 food forms. Aside from factors such as comparative eating quality, the yield and cost data developed in this study make available for the first time to consumers and researchers a basis for making accurate cost comparisons on a large number of foods in various market forms. Among many other foods compared for cost per serving, different market forms of fish and shellfish were compared using yield data and standard home recipes supplied by the National Home Economics Research Center, U. S. Bureau of Commercial Fisheries. Quarterly prices were collected for the calculation of the cost per serving. The size of

serving of each market form was based on the weight of ready-to-serve foods. The convenience forms of fish studied were frozen fried codfish sticks, frozen haddock fish sticks, canned Alaska red sockeye salmon, frozen haddock fish dinner, and canned fish flakes. The convenience forms of frozen crab cakes, canned crab meat, frozen deviled crab, frozen shrimp creole, frozen raw peeled deveined shrimp, canned shrimp, frozen raw breaded shrimp, and prefried breaded frozen shrimp were studied.

#### MARYLAND:

Maryland Board of Natural Resources, Twentieth Annual Report, 1963, 204 pp., printed. Board of Natural Resources, State Office Bldg., Annapolis, Md. Some of the work of the Board of Natural Resources during 1963 included functions of the Departments of Tidewater Fisheries and Game and Inland Fish, and the Water Pollution Control Commission. The report discusses research and management conducted by those agencies and others; new legislation introduced in the Maryland General Assembly, including that pertaining to commercial fisheries; and the conservation budget, 1962/63.

#### MOTION PICTURES:

Strictly Stripers, 16 mm. film, running time 19 minutes, color, sound, on loan, or for sale at \$105. Natural Resources Institute, University of Maryland. College Park, Md. 20742. This film tells the life story of striped bass (*Morone saxatilis*) from the time that large females deposit millions of eggs in the muddy waters of estuaries such as that of the Patuxent River to the climatic moment when that succulent fish is placed on a dinner table. It highlights the economic and recreational importance of striped bass which are eagerly sought by sport and commercial fishermen, fish markets, and consumers alike. Moreover it presents a cross-section of the estuarine and biological research done by the Laboratory to ensure the future of the striped bass and other fish and shellfish in Chesapeake Bay.

#### MUSSELS:

"Bacteriological control of mussels in the growing and in the fully grown stage," by A. M. Wedard, article, *Rivista Italiana d'Igiene*, vol. 23, no. 3, 1963, pp. 157-168, printed in Italian. Nistri Lischi, Piazza del Castellette, No. 7, Pisa, Italy.

#### NETS:

"On the mechanical characters of the sweeping trammel net. I," by Ko Matuda, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 29, Feb. 1963, pp. 135-138, printed. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6. Minatoku, Tokyo, Japan.

#### NEW ENGLAND:

"The New England fishing industry: Part I--A new technology," by Frederick W. Bell, article, *New England Business Review*, Aug. 1965, pp. 2-9, printed. Federal Reserve Bank of Boston, Boston, Mass. Discusses the impact of the introduction of stern trawling on the declining New England fishing industry. Widely used for several years in Europe, Canada, and the Far East, stern trawlers are only now coming into use in the United States. Supporters maintain that those vessels overcome many of the side trawlers' disadvantages, save time, and reduce dan-

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ger to the crews. Profitability of the Narragansett, first stern trawler operated out of a New England port, has been high, with increased construction costs somewhat balanced by larger catches per unit of effort. Stern trawling should be the technique of the future, asserts the author. Its adoption, however, will depend on its ability to attract capital.

#### NEW ZEALAND:

Report of the Marine Department for the Year Ended 31 March 1965, 54 pp., printed, 1965, 2s. (about US\$0.30). R. E. Owen, Government Printer, Wellington, New Zealand. Much of this report is concerned with the commercial fisheries of New Zealand during the Fiscal Year 1965. Included is information on total quantity and value of fishery products marketed in calendar year 1964, spiny lobster fishery, fishing vessels and personnel, landings by species, methods of capture, landings by ports, foreign trade in fishery products, sport fishing, fish-liver oil production, and whaling. Also discusses the rock and dredged oyster fisheries, whitebait fishing, mussels, research and investigation, demonstrations of Japanese gear, Fishing Industry Advisory Council, Freshwater Fishery Advisory Council, Fishing Industry Board, and legislation pertaining to commercial fishing.

#### NORTH ATLANTIC:

"North Atlantic co-operation," by G. J. Gillespie, article, Trade News, vol. 18, no. 1, July 1965, pp. 3-5, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada. Although no specific conservation recommendations were made, the 15th annual meeting of the International Commission for the Northwest Atlantic Fisheries in Halifax in June conveyed the idea that conservation studies have high priority in its future programming. The week-long meeting of the 13-nation fisheries body was opened by the Canadian Minister of Fisheries. He stated that protection of northwest Atlantic seal herds was of particular interest to Canada. One of the more important decisions made at the meeting provided for a joint environmental survey of Georges Bank and a 5-nation research program in the Atlantic salmon fisheries. The subject of Atlantic salmon came to the fore through Canada's concern in the sudden increase in the salmon catch by Greenland fishermen. The meeting also recorded progress toward eventual establishment of international enforcement of fishing regulations in the northwest Atlantic with the exchange of inspection visits by enforcement officers of Canada, the U. S., and the U.S.S.R.

#### NORWAY:

Fishing Gear and Processing Plant from Norway, 1965 (a special edition of Norway Exports), 64 pp., illus., printed. The Export Council of Norway, Drammensveien 40, Oslo 2, Norway. Presents descriptions of fishing gear, vessels, and processing equipment on display at the International Fishing Exhibition, Trondheim, Aug. 19-29, 1965, and the Norwegian Design Center, Oslo, July-Sept. 1965.

"La Norvege a produit l'annee derniere 128,000 t de poisson surgelé" (Norway produced 128,000 metric tons of frozen fish last year), article, La Pêche Maritime, vol. 44, no. 1048, July 1965, pp. 553-535, illus., printed in French, single copy 14 F. (about

US\$2.85). Les Editions Maritime, 190, Blvd. Haussmann, Paris, France.

Selling in Norway, by Grant Olson and Ann C. Holmes, OBR 65-61, 8 pp., printed, Aug. 1965, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

#### NUTRITION:

Meat, Fish, Poultry, and Cheese: Home Preparation Time, Yield, and Composition of Various Market Forms, by Gladys L. Gilpin, Home Economics Research Report No. 30, 71 pp., illus., printed, Aug. 1965, 45 cents. Human Nutrition Research Division, Agricultural Research Service, U. S. Department of Agriculture, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Reports on a comprehensive cooperative investigation undertaken to obtain information on some of the basic factors that contribute to the convenience and satisfaction derived from different forms of food. Preparation time, yield, composition, and other quality characteristics for meat, fish, poultry, and cheese items were investigated in home-prepared and commercially prepared market forms. Thirty-six different kinds of foods in various forms to make a total of 95 food items were included. Proximate composition determinations were made on 31 kinds and preparation forms of fish and shellfish products. Quantitative analysis was made of moisture content, fat, protein, ash, and total carbohydrate and energy value. The information gained will be useful in preparing guides for homemakers and others responsible for planning, selecting, and preparing economical and nutritious diets, as well as in developing standards for commercially-prepared foods.

#### OCEANOGRAPHY:

"Aportaciones españolas durante 1963 a la oceanografía pura y aplicada, nacional e internacional" (Spanish contributions during 1963 to pure and applied national and international oceanography), by Fernando Lozano, article, Boletín Real Sociedad Española de Historia Natural, vol. 62, no. 1, 1964, pp. 99-113, printed in Spanish. Real Sociedad Española de Historia Natural, Paseo de la Castellana, 84, Madrid, Spain.

Bibliography on Physical Oceanography of the Indian Ocean, by Parkash Samuel, Special Bibliographies on Oceanography Contribution No. 2, 137 pp., processed, June 1965. American Meteorological Society, Washington, D. C. The scope of this bibliography is limited to the different aspects of physical oceanography--temperature, density, salinity, chemical composition, waves, currents, circulation, methods of measurement, instruments, and related topics. Papers on bottom topography, geology, and biology have been excluded.

The Gulf Stream (A Physical and Dynamical Description), by Henry Stommel, 261 pp., illus., printed, Second Edition, April 1965, \$6. University of California Press, 2223 Fulton St., Berkeley, Calif. 94720. This is the second edition of an authoritative text on the oceanography of the Gulf Stream with an added chapter covering information acquired since 1958 and

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recommendations based on that data. The opening chapter deals with the early explorations and ideas of the Gulf Stream, from its discovery by Ponce de Leon in 1513 until the early 20th Century. Succeeding chapters explain in technical language the methods of observation used in the Gulf Stream--the reversing bottle, reversing thermometers, bathythermograph, bathypitometer, propeller-type current meters, towed electrodes, air-borne radiation thermometer, and loran; the geostrophic relationship (balance of forces); large-scale features of the North Atlantic circulation; the hydrography of the Gulf Stream; and the wind system over the North Atlantic. Mathematical equations and oceanographic charts are used abundantly in the chapters on linear theories of the Gulf Stream (including the theory of wind-driven ocean currents); nonlinear theories of the Gulf Stream; meanders in the Stream; fluctuations in the currents (including seasonal and long-period fluctuations); and role of the thermohaline circulation (circulation pattern of water caused by changes in temperature and salinity). A chapter of general remarks contains observations on the nature of oceanographic research as well as on the dynamics of the Gulf Stream. "There is scarcely any more firmly rooted idea in the mind of the layman than the notion that the Gulf Stream keeps the European climate warm. So long as it was believed that the Gulf Stream was a river of warm water, this idea did make sense. It is no longer possible to be so certain of the direct climatological influence of the Gulf Stream, for it now seems that it is not so much the Stream itself that is important, as the position and temperature of the large mass of warm water on its right-hand flank," explains the author. Although intended primarily to explain what is known about the Gulf Stream in a way which will interest physical scientists, the book should be valuable to all oceanographers as well as to geographers. The book has an adequate index and a good bibliography.

"Man tests his limits in the ocean's depths," article, Business Week, no. 1880, Sept. 11, 1965, pp. 66-68, 70, illus., printed, single copy \$0.50. McGraw-Hill, Inc., 330 W. 42nd St., New York, N. Y. 10036. Presents highlights of the U. S. Navy's Sealab II project conducted by 3 groups of aquanauts in a stationary pressurized cylindrical tank 205 feet below the Pacific Ocean's surface off La Jolla, Calif., during September-October 1965. The 45 days of experiments, both in and out of the underwater laboratory, add up to the most extensive effort yet to measure man's capability to live and work for long periods under the sea. Though tied to shore, Sealab II is expected to open new worlds for marine biologists and geologists. By staying down for 15 days at a time, the aquanauts carried out research that, were they operating from the surface, would take years to complete. The project leader stated that the next steps in the Navy's deep submergence projects will be to try for greater depths, first to 400 feet with Sealab II, then to 600 feet, and then possibly to 1,000 feet.

"Marine science ship in Mombasa," article, Spear, vol. 7, no. 3, June 1965, pp. 54-57, illus., printed. East African Railways and Harbours, Nairobi, Kenya. Describes the West German Government's new oceanographic research vessel Meteor, which visited Mombasa, Kenya, in early 1965. West Germany

has now joined the 20 nations which will have sent 47 research ships to take part in the International Indian Ocean Expedition when it completes its 6-year program at the end of 1965. The 2,740-ton vessel, which began her tropical service late in 1964 in the Red Sea, has accommodations for 24 scientists in 12 laboratories, is fitted with equipment for making extensive hydrographic and meteorological observations, and has the capacity for great maneuverability provided by a propeller-activated rudder.

"Oceanographic observations from the Eastern Pacific Ocean collected by the R/V Shoyo Maru, October 1963-March 1964," by Eric D. Forsberg and William W. Broenkow, article, Inter-American Tropical Tuna Commission Bulletin, vol. 10, no. 2, 1965, printed. Inter-American Tropical Tuna Commission, La Jolla, Calif. 92038.

Oceanography of the Grand Banks Region and the Labrador Sea in 1964, by Ronald C. Kollmeyer and others, Oceanographic Report No. 10, CG 373-10, 291 pp., illus., printed, June 1965. United States Coast Guard, Washington, D. C.

"Standardizing oceanographic instrumentation is practical," by James L. Verber, article, Under Sea Technology, vol. 6, no. 8, Aug. 1965, pp. 20-21, printed, single copy \$1. Compass Publications Inc., 617 Lynn Bldg., 1111 N. 19th St., Arlington, Va. 22209.

Articles in Geo Marine Technology, vol. 1, no. 8, Aug. 1965. INTEL, Inc., 1075 National Press Bldg., Washington, D. C. 20004:

"Alvin"; "Aluminaut," pp. 16-18, illus.

"Sealab II," by Ralph G. Platt, pp. 7-13, illus. The United States' most ambitious attempt to date to learn how life can be sustained in a marine environment was carried out in fall 1965. Sealab II, an underwater vehicle, rested 205 feet deep on the Pacific Oceanbed, a half-mile off La Jolla, Calif., and in it 3 teams of 10 aquanauts each lived, worked, and were subjected to many physiological and psychological tests. The results of the 45-day program may be as important to the future of mankind as the forays made to date into "outer space," says the author. Sealab II was the second phase of the Navy's "Man-in-the-Sea" program, and was conducted by the Office of Naval Research in collaboration with the Navy's Special Projects Office, as part of the Deep Submergence Systems Program. Sealab I was conducted in 1964, 30 miles off Bermuda, when 4 Navy divers lived and worked successfully at a depth of 193 feet for 11 days. The article includes details of Sealab's construction, operation, and objectives, and the day-by-day aquanaut schedule.

"Vision-ingenuity-sweat," by E. W. Seabrook Hull, pp. 20-24, illus. Tells the story of Bears Bluff Laboratory, Wadmaw Island, S. C.

#### OYSTERS:

El Ostion Antillano, CRASSOSTREA RHIZOPHORAE Guiling, y su Cultivo Experimental en Cuba (The Antillean Oyster and its Experimental Culture in Cuba), by Braulio A. Saenz, Nota Sobre Investigaciones No. 6, 34 pp., illus., printed in Spanish with English abstract, April 1965. Centro de Investigaciones Pesqueras, Instituto Nacional de la Pesca, Havana, Cuba.

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## PERU:

La Pesca Peruana en 1963 (The Peruvian Fishery in 1963), by Lizandro Bedoya Esponda, Serie de Divulgación Científica 24, 41 pp., illus., printed in Spanish. As in previous years, the Peruvian annual fisheries report for 1963 consists largely of statistical tables showing quantity and value of industrial products production; utilization of fish landed in Peru; domestic consumption of fishery products; processed fishery products; investment in the fishing and fish-processing industries; production of frozen and canned fishery products; production and export of fish meal and oil; marine production of fish and shellfish by ports and by species; quantity and value of fishery products consumed in Greater Lima; landings of marine fish and their utilization; foreign trade in fishery products; and whale landings by months.

Política Económica de la Pesquería del Perú (Economic Policy of the Peruvian Fishery), by Javier Iparraguirre Cortez, Informe No. 18, 168 pp., processed in Spanish. Servicio de Pesquería, Ministerio de Agricultura, Lima, Peru. Covers in detail the early history of the Peruvian fishery and its present position among the world's fishing nations; environmental aspects of the fishery, including marine ecology, currents, marine plants and animals, features of the seacoast, and port facilities; and human resources in the fishery, including types of fishermen, their training and specialization, wages, social conditions, and cooperatives and syndicates. Also contains particulars on the economic structure of the fishery, including docks and railroads, processing plants, capital assets of the industry, fishing fleet and gear, and warehouses; financial situation--public and private investment, fishery banks, and foreign investment; private fishery organizations, production and distribution, domestic consumption of fishery products, handling and distribution, foreign trade, and byproducts industries; and policy considerations in regard to conservation, nutrition, socioeconomic conditions, legal regulation, administration, and long-range planning. Included are several statistical tables showing production of industrial products by zones and by species, 1962; utilization of landings, 1953-63; export of fishery products, 1962; and other data.

## PHOSPHORUS:

"The presence of compounds with a carbon-phosphorus bond in some marine invertebrates," by Louis D. Quin, article, Biochemistry, vol. 4, Feb. 1965, pp. 324-330, printed. Society for Experimental Biology and Medicine, 139th St. & Convent Ave., New York, N.Y. 10031.

## POLAND:

"Operating results of B-15 and B-23 trawlers in 1964," article, Polish Maritime News, vol. 8, no. 83/84, July-Aug. 1965, pp. 14-15, illus., printed. Polish Chamber of Foreign Trade, Maritime Branch, ul. Pulaskiego 6, Gdynia, Poland.

Roczniki Nauk Rolniczych (Polish Agricultural Annual), vol. 86, series B, no. 2, 1965, 283 pp., illus., printed in Polish with Russian and English summaries. Wydział Nauk Rolniczych i Lesnych, Polska Akademia Nauk, Pałac Kultury i Nauki, 21 Pietro,

Pokoj 2101, Warsaw, Poland. Some of the articles are: "The effect of increasing fish stock density in the feeding habits of young carp," and "The effect of artificial food on the feeding habits of young carp," by A. Gurzeda; "Changes in protein, fat, water, and dry weight contents in the body of two-year old carp in the period of growth," by P. Wolny, T. Wojno, and R. Trzebiatowski; "Results of feeding young carp on barley," by K. Migala; "The influence of some agencies on the results of young carp wintering," by T. Wojno, R. Trzebiatowski, and P. Wolny; and "The effect of water circulation in constant-flow winter ponds on the results of wintering of two-year old carp," by A. Wysokinski.

Available from Morskiego Instytutu Rybackiego, Wydawnictwo Morskie, Gdynia, Poland:

Prace Morskiego Instytutu Rybackiego, vol. 13, series B (Fishing Technique and Fishery Technology), 1964, 100 pp., printed in Polish. A few of the articles are: "Application of mathematical analysis of the study of the influence of physiological and ecological factors on the change of fat contents in the adult sprats of the Bay of Gdansk," by J. Elwertowski and J. Maciejczyk; "Technological and chemical characteristic of North Atlantic redfish," by K. Hryniewiecka; and "Bacterial flora of sea fish from West African fishing grounds. Part 1--Strains isolated from iced and frozen fish," by J. Kochanowski and M. Maciejowska.

, vol. 13, series C (Economics of Fisheries), 1964, 155 pp., printed in Polish. Some of the articles are: "Economic significance of Baltic sea-weed in Poland," by A. Ropekowski; "Fluctuations of fish landed at fishing ports," by Z. Polanski; "Frozen fish as raw material for fish processing industry (on the basis of 1959 data)," by K. Zukowski; "Analysis of the development of sea-fish consumption in Poland," by B. Kowalewski; "The consumption of fish in the light of household budgets in the period 1957-1960," by S. Laszczynski; and "Statistics of Polish fisheries 1961," by K. Kazmierski, S. Laszczynski, and M. Daszkowska.

## PORTUGAL:

"Relatorio do Gremio dos Industriais de Conservas de Peixe de Setúbal" (Report of the Society of Fish Cannerymen of Setúbal), article, Conservas de Peixe, vol. 20, no. 232, July 1965, pp. 17, 19-21, printed in Portuguese. Sociedade da Revista Conservas de Peixe, Lda., Regueirao dos Anjos, 68, Lisbon, Portugal.

## POULTRY RATIONS:

"Level of fish meal in New England poultry feeds relatively high," article, Feedstuffs, vol. 37, March 6, 1965, p. 25, printed. Miller Publishing Co., 2501 Wayzata Blvd., Minneapolis, Minn.

## PROCESSING MACHINERY:

"Fish processing machine," article, Food Manufacture, vol. 39, May 1964, p. 56, printed. Grampian Press, Ltd., The Tower, Shepherds Bush Rd., Hammersmith, London W6, England.

## RADIATION:

Radionuclide Content of Oceanic Fish, Plankton, and Water in Vicinity of Christmas Island, Mar.-Aug.

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1962, by Arthur D. Welander and Ralph F. Palumbo, UWFL-88, 38 pp., illus., printed, Sept. 4, 1963, \$2. Clearinghouse for Federal Scientific and Technical Information, U. S. Department of Commerce, Braddock and Port Royal Rds., Springfield, Va. 22151.

#### RADIATION PRESERVATION:

Food Preservation by Irradiation, SB 403, Supp. 1, 17 pp., printed, revised Feb. 1965. Clearinghouse for Federal Scientific and Technical Information, U. S. Department of Commerce, Braddock and Port Royal Rds., Springfield, Va. 22151.

"Radiation preservation of meats and seafoods," by R. F. Cain and A. F. Anglemier, article, *Journal of Animal Science*, vol. 23, no. 2, 1964, pp. 572-576, printed. American Society of Animal Production, Colorado State University, Fort Collins, Colo.

#### REFRIGERATED SEA WATER:

"Refrigerated sea water as a storage medium for fish," by John A. Peters, Clarence J. Carlson, and Daniel W. Baker II, article, *ASHRAE Journal*, vol. 7, April 1965, pp. 64-67, printed. American Society of Heating, Refrigerating and Air-Conditioning Engineers, 62 Worth St., New York, N. Y. 10013.

#### REFRIGERATION:

Preservation of Fish Products by Refrigeration, by V. P. Zaitsev, TT 65-50099, 323 pp., illus., processed, 1965, \$7. (Translated from the Russian, *Kholodil'noe Konservirovanie Rybnikh Produktov, Pishchepromizdat, Moscow, U.S.S.R., 1962.*) Clearinghouse for Federal Scientific and Technical Information, U. S. Department of Commerce, Braddock and Port Royal Rds., Springfield, Va. 22151. A comprehensive handbook covering the theory and practice of fish preservation by refrigeration (chilling, freezing, storage) and of thawing and fish-fillet production. Advanced planning of shore refrigerating plants and of refrigerated vessels is explained, and problems of product quality control are discussed. Equipment and machinery used for fish refrigeration are described. The large number of schematic drawings, diagrams, and photos should contribute to the usefulness of this book to mechanical engineers and technologists in the fish-processing industry.

#### SALMON:

"Food and feeding habits of Pacific Salmon (Genus *Oncorhynchus*) in their oceanic life, by Jun Ito, article, *Bulletin of the Hokkaido Regional Fisheries Research Laboratory*, no. 29, 1964, pp. 85-97, printed. Hokkaido Regional Fisheries Research Laboratory, Yoichi, Hokkaido, Japan.

"Kokanee salmon for the Great Lakes," by F. P. Mahler, article, *Ontario Fish and Wildlife Review*, vol. 4, no. 2, Summer 1965, pp. 2-5, illus., processed. Department of Lands and Forests, Parliament Bldgs., Toronto 5, Canada.

The Migration, Composition, Exploitation, and Abundance of Odd-Year Pink Salmon Runs in and Adjacent to the Fraser River Convention Area, by A. S. Hourston, E. H. Vernon, and G. A. Holland, *Bulletin* 17, 156 pp., illus., printed, 1965. International Pacific Salmon Fisheries Commission, New Westminster, B. C., Canada.

"Net production of juvenile coho salmon in three Oregon streams," by D. W. Chapman, article, *Transactions of the American Fisheries Society*, vol. 94, no. 1, 1965, pp. 40-52, printed. American Fisheries Society, 1404 New York Ave. NW., Washington, D. C. 20005.

Population Dynamics of Pacific Pink Salmon, *ONCORHYNCHUS GORBUSCHA* (Walbaum), by Yu. E. Lapin, JPRS 25993. (Translated from the Russian *Voprosy Ikhtologii*, vol. 4, no. 2, 1964, pp. 233-242.) Clearinghouse for Federal Scientific and Technical Information, U. S. Department of Commerce, Port Royal and Braddock Rds., Springfield, Va. 22151.

"The relationship of age to length in Puget Sound resident chinook salmon," by J. E. Lasater and Frank Haw, article, *Fisheries Research Papers*, vol. 2, no. 3, 1964, pp. 44-50, printed. Washington Department of Fisheries, Rm. 115, General Administration Bldg., Olympia, Wash.

Salmon of the North Pacific Ocean, Part IX--Coho, Chinook and Masu Salmon in Offshore Waters, by Harold Godfrey, James E. Mason, and Shoichi Tanaka, *Bulletin* No. 16, 138 pp., illus., printed, 1965. International North Pacific Fisheries Commission, 6640 NW. Marine Dr., Vancouver 8, B.C., Canada. The Commission is publishing in its bulletin series a comprehensive report, "Salmon of the North Pacific Ocean." The purpose of this report is to present the results of research on salmon (*Oncorhynchus* spp.) conducted since 1955 under an extensive program designed by the Commission and executed by research organizations of the 3 countries which established the Commission--Canada, Japan, and the United States. The various parts are being published out of numerical order, each part being published as it is completed by the joint-reporting assigned to its preparation. Parts previously published were: Part I--Introduction and catch statistics for North Pacific salmon; Part II--Review of oceanography of the subarctic Pacific Region; and Part V--Offshore distribution of salmon. Part IX consists of reports on the life history and offshore distribution of coho, chinook and masu salmon on the high seas of the North Pacific Ocean.

Seal Damage to Salmon Fisheries, by B. B. Rae and William Shearer, *Marine Research* no. 2, 39 pp., printed, 1965. Department of Agriculture and Fisheries for Scotland, Edinburgh, Scotland.

"Steroid hormones in the plasma of spawned Atlantic salmon (*Salmo salar*) and a comparison of their determination by chemical and biological assay methods," by D. R. Idler, H. C. Freeman, and B. Truscott, article, *Canadian Journal of Biochemistry*, vol. 42, no. 2, 1964, pp. 211-218, printed. National Research Council, Ottawa, Canada.

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"La flota pesquera congeladora Española" (The Spanish freezer fishing fleet), article, Pesca y Marina, vol. 17, no. 4, Aug.-Sept. 1965, pp. 14-15, printed in Spanish. Fernando Flores Limitada, 705 N. Windsor Blvd., Los Angeles 38, Calif.

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## SPINY LOBSTER:

Maintaining the Catch (The Western Australian Crayfish), 16 pp., illus., printed. Western Australian Department of Fisheries and Fauna, Perth, Australia. An informational fold-out chart for spiny lobster fishermen explaining the critical need to stabilize present catches and to find ways of increasing the stocks. Diagrams demonstrate the life cycle of the spiny lobster and biological and exploratory research being conducted on that species. The importance of fishermen supplying catch information to aid in research, as well as using pots constructed to provide escapement for undersized individuals, is also stressed.

## STATISTICS:

Bulletin Statistique des Peches Maritimes, 1962 (Statistical Bulletin of Marine Fisheries, 1962), 54 pp., printed in French and English, 1965. Conseil Permanent International pour l'Exploration de la Mer, Charlottenlund Slot, Charlottenlund, Denmark.

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Foreign Trade Regulations of the Syrian Arab Republic, by Helen D. Grayson, OBR 65-52, 8 pp., printed, July 1965, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

## TEXAS:

Publications of the Institute of Marine Science, vol. 10, June 1965, illus., printed, single copy \$4.15. Institute of Marine Science, The University of Texas, Port Aransas, Tex. 78373. Includes, among others, articles on: "Distribution and growth of penaeid shrimp in Mobile Bay, Alabama," by Harold Loesch; "Vertical distribution of the planktonic stages of penaeid shrimp," by Robert F. Temple and Clarence C. Fischer; "Fish stocks from a helicopter-borne purse net sampling of Corpus Christi Bay, Texas, 1962-1963," by Robert S. Jones; "A trawl survey of the shallow Gulf fishes near Port Aransas, Texas," by John M. Miller; "Mollusks from the deeper waters of the northwestern Campeche Bank, Mexico," by Winne H. Rice and Louis S. Kornicker; and "An annotated checklist of the fishes of the Galveston Bay System, Texas," by Jack C. Parker.

## THAILAND:

Bottom Fish Resources Investigation in the Gulf of Thailand and an Outlook on Further Possibilities to Develop the Marine Fisheries in South East Asia, by K. Tiews, 42 pp., illus., printed in English with German summary. (Reprinted from Archiv fur Fischereiwissenschaft, vol. 16, no. 1, July 1965, pp. 67-108.) Archiv fur Fischereiwissenschaft, Gustav Wenzel & Sohn, Braunschweig, Federal Republic of Germany.

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Tide Tables--High and Low Water Predictions 1966--Central and Western Pacific Ocean and Indian Ocean, 386 pp., printed, 1965, \$2. Coast and Geodetic Survey, U. S. Department of Commerce, Washington, D. C. 20230.

## TRANSPORTING FISH:

"Necesidad, conveniencia económica y técnica del transporte por carretera de los productos de la pesca en regimen de frio" (Need, economic convenience, and technique of road transportation of refrigerated fishery products), by G. Ciani, article, Revista del Frio, vol. 9, no. 3, July-Sept. 1964, pp. 99-108, printed in Spanish with French and English abstracts. Centro Experimental del Frio, Serrano, 150; Madrid, Spain.

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Le Chalut (The Trawl), by Claude Nedelec and Louis Libert, Revue des Travaux, vol. 28, no. 2, 190 pp., printed in French, 1964. Institut Scientifique et Technique des Peche Maritime, 59 Avenue Raymond-Poincare, Paris 16, France.

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California "Catchable" Trout Fisheries, by Robert L. Butler and David P. Borgeson, Fish Bulletin 127, 47 pp., illus., printed, 1965. Office of Procurement, Documents Section, P. O. Box 1612, Sacramento, Calif. 95807.

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"Trout capital of the East," by Don Carpenter, article, Virginia Wildlife, vol. 26, no. 9, Sept. 1965, pp. 16-18, illus., printed, single copy 20 cents. Commission of Game and Inland Fisheries, P. O. Box 1642, Richmond, Va. 23213. Describes activities of the Virginia Trout Company, Monterey, Virginia, in the mountainous Northwestern part of the State. This prosperous firm rears trout from Washington State rainbow trout eggs, sells fingerlings to farmers for their own ponds, provides trout fishing streams for the use of anglers at a moderate fee, and processes frozen trout for sale to hotels and supermarkets.

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An Analysis of California's Albacore Fishery, by Harold B. Clemens and William L. Craig, Fish Bulletin 128, 308 pp., illus., printed, 1965. Documents Section, P. O. Box 1612, Sacramento, Calif. 95807. This report updates studies initiated in 1951 and sets forth results obtained from part of the albacore investigations conducted through 1961 by researchers at the California State Fisheries Laboratory. It is that State's contribution to a proposed international exchange of information on the Pacific albacore. Included are sections on the history of commercial fishing, both hook-and-line and purse-seine fisheries; the commercial fisheries for albacore during the years 1916-61; details of landings during the cold-water seasons (1951-56), the warm-water seasons (1957-59), and the cooling years (1960-61); catch analysis, using catch reports and logbook data; the sport fishery for albacore; and condition of the resource. A large number of statistical tables, graphs, and charts are used. A few of them give data on: landings of albacore in Northeastern Pacific ports by commercial fishermen, 1936-61; calculated lengths and weights for albacore age groups; and annual average of monthly sea-surface temperatures collected at La Jolla, 1916-61.

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Tuna Fishing, no. 36, July 1965, 48 pp., illus., printed in Japanese. All Japan Investigative Conference of Tuna, 2-7, Hirakawa-cho, Chiyoda-ku, Tokyo, Japan.

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Foreign Trade Regulations of Tunisia, by William J. Bushwaller, OBR 65-56, 8 pp., printed, July 1965, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

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Balik ve Balıkcılık, vol. 13, no. 7, July 1965, 32 pp., illus., printed in Turkish with English table of contents. Et ve Balık Kurumu G. M., Balıkcılık Mudurluğu, Besiktas, Istanbul, Turkey. Two of the articles are: "One boat and two boats system trawl (Part II)," by Tekin Mengi; and "The role of fish in animal feeding and nutritional contribution of fish products (Part V)," by Macide Akgunes.

#### UNITED KINGDOM:

Fish Stock Record, 1964, 50 pp., illus., processed, 1965. Fisheries Laboratory, Ministry of Agriculture, Fisheries and Food, Lowestoft, Suffolk, England. Discusses in detail the production, year-classes, and length and age composition of species landed in the demersal fisheries in near, middle, and distant waters; and catch and effort in the pelagic fisheries for herring and sprats. Includes statistical tables and graphs showing total catches of selected species from demersal fisheries of Great Britain, 1963-64; the English herring fisheries, catch and effort; distribution of haddock catches by English and Scottish trawlers at Faroe Islands; length composition of English sprat landings, 1964/65; and other related data.

"Fishery Limits Act, 1964" (An Act to extend the British fishery limits and amend the definition of "sea-fishing" in the Sea Fisheries Act, 1883), 31 July 1964, Statutes for 1964, Chapter 72, Food and Agricultural Legislation, vol. XIII, no. 4, June 1965, SVI/2, 3 pp., printed, single copy \$1. International Documents Service, Columbia University Press, 2960 Broadway, New York, N. Y. 10027.

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Scottish Fisheries Bulletin, no. 23, June 1965, 32 pp., illus., printed. Marine Laboratory, Department of Agriculture and Fisheries for Scotland, Victoria Rd., P. O. Box 101, Torry, Aberdeen, Scotland. Some of the articles are: "Overfishing and conservation," by B. B. Rae; "Forecast for Scottish North Sea and west coast herring fisheries in 1965," by B. B. Parrish and A. Saville; "The wing-trawl on larger ships," by William Dickson; "Underwater observations on a patch of herring spawn," by C. C. Hemmings; "Her-

ring trawling off the west coast of Scotland," by I. G. Baxter; and "Fat in herring," by N. P. Wilkins.

Scottish Sea Fisheries Statistical Tables, 1964, 50 pp., printed, 1965. Department of Agriculture and Fisheries for Scotland, Edinburgh, Scotland.

Torry Research Station Annual Report, 1964, on the Handling and Preservation of Fish and Fish Products, 57 pp., illus., printed, 1965, 5s. (about US\$0.70). Ministry of Technology, Millbank Tower, Millbank, London SW1, England. (For sale by Sales Section, British Information Services, 845 Third Ave., New York, N. Y. 10022.) Covers briefly some of the Station's research projects of current interest--objective measurement of the freshness of wet fish, superchilling to 0° C., packaging of wet fish, boxing at sea, assessment of frozen fish quality, freezing fillets at sea, thawing of frozen fish, and retail quality of frozen fish. Describes in detail principal accomplishments during 1964 in the fields of improvement in handling, treatment, and quality of wet fish; freezing and cold storage; smoke-curing; canning; drying; and industrial products. Explains programs in food hygiene, bacteriological examination of shellfish, collections of marine and industrial bacteria, protein reactions during cold storage of cod, autoxidation in white fish, semiconductivity in frozen cod muscle, and industrial liaison and education. Also contains a list of reports and papers published by Torry personnel during 1964 on the handling and preservation of fish and fishery products.

Available from Grampian Press Ltd., The Tower, 229-243 Shepherds Bush Rd., Hammersmith, London W6, England:

"Conservation is main theme of British industry reports," article, *World Fishing*, vol. 14, no. 8, Aug. 1965, pp. 6-9, illus., printed, 3s. 6d. (about US\$0.55). The 1964 annual reports of some of the major organizations serving the British fishing industry are summarized. The organizations are the White Fish Authority, The British Trawlers' Federation, The Scottish Home Department, Herring Industry Board, and Torry Research Station. One industry leader poses this question: "Should we not look to the seas, which occupy 70 percent (of the Earth's surface) and at present supply only about one percent of human food and 12 percent of the protein component of the world human diet and which . . . could provide enough protein to meet the needs of 10 times the present world population?"

*World Fishing*, vol. 14, no. 9, Sept. 1965, 106 pp., illus., printed. This issue, devoted almost entirely to the Scottish fisheries, contains articles on: "The 20-year-old objective"; "Ring-netting most important catching method"; "Which net do I need?"; "First of three"; "Germany switches to midwater trawl"; "Norway North Sea catch doubles"; "Herring industry at bay"; "Fishermen's views wanted"; "Will purse seine ruin stocks?"; "Norwegians in action"; "Manpower and purse seining"; "Improving seiner stability"; "Ring netters have doubts"; "How much power does a Scottish M.F.V. need?"; "Some recent completions by Scottish yards"; "Scotland's frozen scallops"; "Shellfish catch reaches record level"; "Aberdeen owners reorganize fleet"; and "Where do we go from here?"

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#### UNITED STATES GOVERNMENT:

Federal Statistical Directory, 1965, 195 pp., printed, Twentieth Edition 1965, 70 cents. Office of Statistical Standards, Bureau of the Budget, Executive Office of the President, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) The principal purpose of this directory is to serve as a guide to easier direct communication among the various offices of the Federal Government working on statistical programs. Contains names, titles, phone numbers, and addresses of individuals engaged in statistical planning and services in the Executive Office of the President; Departments of Agriculture, Commerce, Defense, Health, Education, and Welfare, Interior, Justice, Labor, State; the Post Office Department; Treasury Department; independent agencies such as the Atomic Energy Commission, Federal Aviation Agency, and National Labor Relations Board; and agencies outside the Executive Branch including U. S. Courts and offices associated with the Congress.

#### UNITED STATES NAVY:

The Ships and Aircraft of the U. S. Fleet, compiled and edited by James C. Fahey, 64 pp., illus., printed, eighth edition 1965, \$3.50. U. S. Naval Institute, Annapolis, Md. 21402.

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Opredelitel' Promyslovyykh Ryb SSSR. Uchebn. Posobie Dlya Ikhtologich. Spetsial'nostei Vyssh. Uchebn. Zavedenii, 4-e Pererabot. i dop. izd. (Key for the Identification of U.S.S.R. Commercial Fishes. A Textbook for Students of Ichthyology in Colleges and Universities. Fourth Revised and Enlarged Edition), 318 pp., illus., printed in Russian. 1964, 70 Kop. (about US\$0.80). Pishchepromizdat, Mruzooskii, Propekt No. 1, Moscow, U.S.S.R.

Translations from the Russian available from the Clearinghouse for Federal Scientific and Technical Information, U. S. Department of Commerce, Port Royal and Braddock Rds., Springfield, Va. 22151:

Freshwater Fishes of the U.S.S.R. and Adjacent Countries, by Leo S. Berg, vol. II, OTS 63-11056, 496 pp., and vol. III, OTS 63-11057, 510 pp., printed, 1964 and 1965.

Key to Parasites of Freshwater Fish of the U.S.S.R., by Bykhovskaya Pavloskaya and others, OTS TT 64-11040, 919 pp., printed, 1964.

Articles from Rybnoe Khoziaistvo, vol. 40, no. 8, August 1964, printed in Russian, single copy 50 Kopecks (about 56 U. S. cents). Rybnoe Khoziaistvo, V. Krasnosel'skaia 17, Moscow B-140, U.S.S.R.:

"Use of a hydraulic system on a stern trawler," by A. M. Chukhontsev, pp. 87-89; and "New system of payment for the fishermen," pp. 93-94.

\_\_\_\_\_, vol. 40, no. 9, September 1964: "Some results of acclimatizing pink salmon in North Europe," by V. V. Azbelev and M. Lazarev, pp. 7-8; "There will be more salmonid fishes," p. 30; "Selection of an optimum load and speed of freeze trawlers during fishing cruises," by S. I. Logachev, pp. 36-39 (continuation of article in no. 8, pp. 47-

49). "Catamarans, a possible type of vessel for the fishing fleet," by Yu. M. Rizanov, pp. 40-41; "Bathymograph for fishing vessels," by A. Qvsyannikov, pp. 41-42; "Mechanization of roe salting," p. 49; "Present work of vessels of the BMRT type (freezer trawlers) and of side trawlers," by L. N. Pechenik, pp. 51-53; "Shark fishery in the Atlantic Ocean," by Yu. A. Torpin, pp. 54-57; "Prospects for using ice with biomyacin for preserving fresh, cooled fish," by G. B. Dubrova and Yu. A. Ravich-Shcherbo, pp. 60-61; "Variation in the total effort in cutting tunny with a knife with a straight edge (blade)," by M. A. Yakubov, pp. 62-65; "Machine for breeding fish in an electric field with corona discharge," by N. I. Tikhonov, pp. 65-69; "The Economic efficiency of mechanization and automation on fishing vessels," by E. I. Futter and M. M. Kantor, pp. 73-74; "A new, small-sized meal-and-oil plant for trawlers," by N. N. Ryndich, pp. 81-83; and "The first teaching manual on the economy of the fishing industry" (S. V. Mikhailov, 1962. The economy of the fishing industry of the U.S.S.R. Pishchepromizdat, Moscow), pp. 90-91.

\_\_\_\_\_, vol. 41, no. 3, 1965, 100 pp., printed in Russian. Some of the articles are: "Stock of individual schools of herring in the North Atlantic," by S. S. Fedorov; "Growth and maturation as main factors of the dynamics of fish stock," by M. A. Pavlov; "Apparatus for censusing young commercial fishes caught by fine-meshed nets," by R. A. Mailian; "Effect of predatory fishes on the extension of seaward migration of salmon," by E. L. Bakshtanskii; "Abundance and fisheries of crayfish in the bodies of water of Volgograd Province," by V. P. Negrobov; "Moorings of a BMRT to a floating base and loading and unloading works at sea from both sides," by I. F. Tolokubov; "Trawling at great depths," by A. Ia. Maklakov; "Characteristics of fishing operations in the Central Atlantic," by L. N. Domanevskii and O. G. Riabikov; "First result of two-boat trawling," by G. G. Krylov; "Selection of light arrangement in electric fishing," by I. V. Nikonorov; "Methods of electric fishing in the inland bodies of water," by M. R. Maizella; "Combined synthetic coatings for the preservation of fishery products," by M. N. Vakhrusheva; "Content of carcinogenic substances in smoke and smoked products," by P. P. Dikun; "Methods of producing slightly salted caviar from the Pacific salmon," by E. A. Nasedkina; "Rapid method of agar extraction," by O. P. Lukachev; "New agar plant in the Maritime territory," by V. D. Koval'; and "Some problems of whaling," by A. A. Sudakov.

\_\_\_\_\_, vol. 41, no. 4, 1965, 95 pp., printed in Russian. Some of the articles are: "Technological progress in the fishing industry in 1965," by E. G. Pavlov; "Forecasting relative yield of the Baltic cod and bank herring of the North Sea," by A. E. Antonov; "Considerations on ways of development of pond fish culture," by K. A. Sadlaev; "Some characteristics of the growth and wintering of young-of-the-year herbivorous fishes," by I. N. Biziaev; "Marking whales in the Far East," by V. A. Arsen'ev; "Determination of the form of the net part of a trawl by photogrammetry," by G. E. Bidenko; "Polystyrene floats for trawl fishing," by B. P. Zimin; "Methods of electric fishing in freshwater bodies," by M. R. Maizelis; "New process of cold bream and roach smoking," by L. E. Shavshaeva; "Use of a sardine dryer of continuous action for the production of 'herring in oil'

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canned fish," by Z. T. Nechaeva; "Mathematical approach in the administration of fisheries," by V. Tishinskii; "Some problems of organizing paired expeditions by fishing boats," by N. Medushevskii; and "System of national control in observing fishing regulations in the North Atlantic," by A. D. Druzhinin.

Articles from *Rybovodstvo i Rybolovstvo*, 1959, printed in Russian. *Rybovodstvo i Rybolovstvo*, Orlikov Pereulok 1/11, Moscow I-139, U.S.S.R.:

"Sortirovochnyi ryboulovitel'" (Selective fishing gear), by G. Kondrat'ev, no. 4, pp. 16-17.

"Tovarnyi karp v nerestovo-vyrostnom" (Growing commercial carp in nursery pond farms), by G. Zhukovskii, no. 4, pp. 3-7.

"Vyrashchivanie ryboposadochnogo materiala v kolkhoze" (Growing fish stock in a kolkhoz--collective farm), by G. Polyakov, no. 3, pp. 5-8.

Articles from *Trudy, Atlanticheskii Nauchno-issledovatel'skii Institut Morskogo Rybnogo Khoziaistva i Okeanografii, "AtlantNIRO"* (continues *Trudy BaltNIRO*), vol. 10, printed in Russian, 1964. Four Continent Book Corp., 156 - 5th Ave., New York, N. Y. 10010:

"Spawning area of Atlantic herring at the western coasts of the Shetland, Orkney, and Hebrides Islands," by L. S. Shapiro, pp. 95-99; "Distribution of bottom fishes at Newfoundland and Labrador, and a possible forecasting of commercial concentrations," by B. E. Karasev and V. I. Sauskan, pp. 124-141; "Present state of the herring stock and the herring fishery in the North Sea," by G. P. Domashenko, pp. 142-149; "Composition of the stocks of ocean perch, cod, and haddock in the Newfoundland and Labrador regions," by A. S. Noskov and V. A. Rikhter, pp. 150-162; "Productivity of Atlanto-Scandian herrings," by A. S. Noskov, pp. 163-167; "Possibility of forecasting the time of spawning immigration to the Norwegian coast of Atlanto-Scandian herring," by K. M. Rudnev and T. A. Bernikova, pp. 168-170; "Forecast of long-term variations of relative abundance of cod, sprat, and herring in the southern Baltic for the years 1961-80," by A. E. Antonov, pp. 171-175; "Determination of the stock of commercial fish by using data from fishery and the stock," by I. G. Fridlyand and A. T. Erokhin, pp. 176-178; "Method of determining age and growth of Baltic cod," by G. I. Tokareva, pp. 179-191; "New fishing areas at northwestern Africa," by K. G. Kukhlorenko, pp. 205-208; "Method of estimating the fish-holding ability of stationary seine traps," by Yu. S. Sergeev, pp. 221-240; "Selection of optimum speed during bottom trawling or herring from large (BMRT) trawlers," by G. E. Bidenko, pp. 249-260; "Determining the influence of wind and currents on trawling," by G. E. Bidenko, pp. 261-265; "Calculating the depth of the net's edge for an occasional lowering of the net mass," by N. N. Andreev, pp. 283-291; "Calculating the suction depth of the fish pump by deep lowering of the suction hose," by M. M. Rozenshtein, pp. 292-302; "Freezing of sprat on fishing vessels," by L. S. Baidalinova, pp. 319-320; "Opti-

mum thermal regime by cold smoking of herring," by V. N. Podsevalov and L. S. Baidalinova, pp. 321-337; "Basis for sterilizing preserved fish in the light of Boll's theory," by S. A. Artyukhova, pp. 338-343; "Increasing the accuracy of the individual operation in the technological processing of sprat from frozen raw material," by M. S. Bidenko, pp. 344-357; and "A comparison of the efficiency in the use of BMRT trawlers from Murmansk and Kaliningrad in the Newfoundland area in 1960," by A. I. Kirillova, pp. 358-364.

*Trudy Kaliningradskogo Tekhnicheskogo Institut Rybnoi Promyshlennosti i Khoziaistva*, no. 14, 1962, 170 pp., printed in Russian. Four Continent Book Corp., 156 Fifth Ave., New York, N. Y. 10010. Some of the articles are: "Study of the process of purse seining by the method of mechanical imitation," by N. N. Andreev; "Stability of the central wire of the leading wing of a stationary seine," and "Catching ability of a bottom seine," by V. A. Ionas; "Theoretical investigation of the use of a tuna fishing line," by L. I. Metelkin; "Storm resistance (stability) of stationary seines," by V. M. Pankov; "Catching ability of stationary salmon seines," and "Study of the efficiency of stationary salmon seines on the western coast of Kamchatka," by E. D. Karakotskii; "Use of the circulation-breaker theory of a rectangular wing of small length for determining the hydrodynamical characteristics of a trawl door," by A. L. Fonarev; "Preliminary results of the study of the resistance of a net," by E. Iu. Obolenskii; "Stocks, forecasts and real catches of fish in the Azov Sea," by N. T. Senin; and "Some problems in the experimental study of the catching ability of trawls," by V. P. Kondrat'ev.

, vol. 18, 1964. Some of the articles are: "Conditions for comparing fishing gear," by S. L. Fridman, pp. 181-199; "The shape of the opening of the bottom trawls," by V. P. Kondrat'ev, pp. 200-202; "Use of fish intestines for producing feed products rich in B vitamins," by P. I. Andrushenko, pp. 271-274; and "Rapid method for determining fat content in herring on board vessels," by I. N. Simonova and L. K. Davydova, pp. 275-279.

*Trudy Vsesoiuznyi Nauchno-Issledovatel'skii Institut Morskogo Rybnogo Khoziaistva i Okeanografii*, vol. 49, 1964, 260 pp., printed in Russian. Four Continent Book Corp., 156 Fifth Ave., New York, N. Y. 10010. Some of the articles are: "Biology and fishery of the Kamchatka crab *Paralithodes camtschatica* (Tilesius) in the southeastern part of the Bering Sea," by N. G. Korolev; "Quantitative distribution of the bottom fauna in the Gulf of Alaska," by V. V. Shevtsov; "Some results of the study of the biology and distribution of shrimps in the Pribilof area of the Bering Sea," by B. G. Ivanov; "Feeding habits of ocean perch in the Bering Sea," by V. A. Skalkin; "Basic characteristics of the biology of the Pacific halibut (*Hippoglossus hippoglossus stenolepis* Schmidt) in the Bering Sea," by N. P. Novikov; "Materials on the biology of rock sole (*Lepidopsetta bilineata*)," by D. A. Shubnikov and L. A. Lisovenko; "Materials on the biology of some flounder species in the eastern part of the Bering Sea," by T. A. Mineeva; "Herring in the eastern part of the Bering Sea," by Iu. I. Dudnik and E. A. Usol'tsev; "Intraspecific variation of the Pacific ocean perch (*Sebastes alutus* Gilbert)," by V. V. Barsukov; and "Chemical characteristics of

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the yellowtail flounder, codfish and Alaska pollock in the southeastern part of the Bering Sea," by M. N. Krivobok and O. I. Tarkovskaia.

\_\_\_\_\_, vol. 50, 1964. Some of the articles are: "Methods of estimating relative abundance of populations of commercial stocks, and rate of exploitation by the fishery," by T. F. Dement'eva, pp. 7-38; "Method for studying the biological features in fish populations and their variations," by K. A. Zemskaya, pp. 39-44; "Problems associated with estimating a rational fishing intensity," by V. A. Abakumov, pp. 179-191; "Main stages in the development of the sturgeon fisheries in the Caspian water basin," by Z. S. Korobochkin, pp. 59-86; "Comparative characteristics of fishery and biology of Azov Sea sturgeons," by N. L. Chugunov and N. I. Chugunova, pp. 87-182; "Fishery and biology of the Caspian beluga (*Huso huso* Linne), by N. Ya. Babushkin, pp. 183-258; "Present state and forecasting of fluctuations in the stocks of *Acipenser stellatus* in the Caspian Sea by regulated river flow," by M. P. Borzenko, pp. 259-286; "Acipenseridae in the northwestern Black Sea," by A. I. Ambroz, pp. 287-347; and "Biology, breeding (artificial reproduction), and fishery for Acipenseridae; bibliography," by G. A. Potapova, pp. 348-409.

Articles from *Voprosy Ikhtologii*, vol. 4, no. 1, 1964, printed in Russian. *Akademiia Nauk SSSR, Ikhtologicheskaya Komissiya*, Moscow, U.S.S.R.:

"O kormovoi baze dlya pelagicheskikh promyslovykh ryb oz. Baikal" (The food supply of pelagic commercial fishes in Lake Baikal), by M. M. Kozhov, pp. 125-135.

\_\_\_\_\_, vol. 4, no. 2, 1964. "Sturgeons from the Samur River," by Yu. S. Saidov, N. A. Azizova, and N. A. Okolot, pp. 243-248; "Influence of water temperature on the fish supply available to Barents Sea trawling," by K. G. Konstantinov, pp. 255-269; and "Comparative characteristics of the river growth of salmon (*Salmo salar*) naturally spawned and artificially hatched," by L. A. Petrenko, pp. 342-347.

\_\_\_\_\_, vol. 4, no. 3, 1964. "Fish behavior and fishing technique," by D. V. Radakov and A. I. Treshchev, pp. 401-410; and "On the biology of the polar cod, *Boreogadus saida* (Lepechin)," by B. K. Moskalenko, pp. 433-442.

#### VENEZUELA:

Principal Manufacturing Industries in Venezuela, OBR 65-45, 32 pp., printed, July 1965, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) A few paragraphs deal with fish and shellfish canning, and frozen shrimp.

"La zona marina de la isla Margarita" (The marine area of Margarita Island), by Ramon Margale, article, *Iberica*, vol. 43, no. 37-38, July-Aug. 1965, pp. 270-273, illus., printed in Spanish, single copy 30 ptas. (about US\$0.50). Iberica, Palau, 3, Apartado 759, Barcelona-2, Spain.

#### WEATHER CHARTS:

The following processed weather charts, 4 pp. each, are published by the Weather Bureau, U. S. Depart-

ment of Commerce, Washington, D. C. For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402, 10 cents each. Charts show stations displaying small craft, gale, whole gale, and hurricane (coastal charts only) warnings; explanations of warning displays; and schedules of AM and FM radio, TV, and radiophone stations that broadcast weather forecasts and warnings.

Coastal Warning Facilities Chart, Manasquan, N. J., to Cape Hatteras, N. C., and Chesapeake Bay, 1965, C 30.2273:M 31/965.

Coastal Warning Facilities Chart, Montauk Point, N. Y. to Manasquan, N. J., 1965, C 30.2273:M 76/965.

Small Craft, Gale and Whole Gale Warning Facilities Chart, Great Lakes: Huron, Erie, and Ontario, 1965.

#### WEST AFRICA:

"La peche en Afrique occidentale en 1964" (The West African fishery in 1964), article, *La Peche Maritime*, vol. 44, no. 1048, July 1965, pp. 564-567, illus., printed in French, single copy 14 F. (about US\$2.85). Les Editions Maritimes, 190, Blvd. Haussmann, Paris, France.

#### WESTERN EUROPE AND CANADA:

Market Profiles: Western Europe and Canada, OBR 65-34, 20 pp., printed, June 1965, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

#### WHALING:

International Commission on Whaling--Fifteenth Report of the Commission (Covering the Fifteenth Fiscal Year 1st June 1963 to 31st May 1964), 72 pp., illus., printed, 1965. International Commission on Whaling, Whitehall Place, London SW1, England. This report covers the Fifteenth Meeting of the Commission, held in London, July 1-5, 1963, and the meeting of the Scientific Committee at Sandefjord, June 16-19, 1964. Information is given on catch limitation and quotas for member countries; the 1963/64 catch by Antarctic pelagic expeditions, land stations, and factoryships; Antarctic pelagic whaling season for the various species; report of the Scientific Committee on the state of the Antarctic whale stocks; and recommended regulation of blue, fin, sei, and sperm whales. Also covered are blue and humpback whale stocks in the North Atlantic; North Pacific stocks; continuation of whale marking programs; scientific investigation of the whale stocks by a special committee; international observer program; Commission finances; permits to take whales for scientific purposes; and committee meetings. Among the appendices are the agenda for the Fifteenth Meeting; note on the effects of various catch quotas; infractions reported during the 1963/64 season (Antarctic) and the 1963 season (outside the Antarctic); statistical data on the whale oil production, 1953/54-1963/64; and map of the world showing Antarctic areas and the regions closed to factoryships for taking and treating baleen whales.

"Of whales and whaling," by Noel Simon, article, *Science*, vol. 149, no. 3687, Aug. 27, 1965, pp. 943-946, printed, single copy US\$0.35. American Association

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for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005. Reviews the history of whaling, efforts at catch restrictions by the International Whaling Commission, decline of the Antarctic whaling stocks, and recommendations for restoring the stocks. The author emphasizes that: "Rational utilization of this resource is perfectly legitimate, but exploitation to the point of extermination is as inexcusable as it is shortsighted. Quite apart from ethical considerations, total destruction of whale stocks does not make very good economic sense. . . . Adoption by the commission of the recommendations of its own scientific advisers . . . would provide a blueprint both for ensuring the continuance of whale stocks and for securing the whaling industry's own means of existence."

"The world catch 1964," article, Norsk Hvalfangst-Tidende (The Norwegian Whaling Gazette), vol. 54, no. 7, July 1965, pp. 151-162, illus., printed in Norwegian and English. Hvalfangerforeningen, Sandefjord, Norway.

#### YEARBOOK:

Consumers All--The Yearbook of Agriculture 1965, 510 pp., illus., printed, Sept. 1965, \$2.75. U. S. Department of Agriculture, Washington, D. C. (For

sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) The 1965 edition of the Yearbook of Agriculture is devoted to furthering the art of being a thoughtful and discerning consumer. Chapters are grouped according to subject--houses, furnishings, equipment, finances, safeguards, plants, outdoors, recreational activities, clothing, and food. Although no chapters on fishery products are included, the general subject of food is given major attention--including diets for weight-watchers, savings in buying food, and suggestions for preparing meat, vegetables, dairy products, bread, beverages, and other products. Fish is mentioned incidentally when discussing calorie value, cooking, diet needs, and refrigeration.

#### CORRECTION

In the October 1965 issue, page 119, Fish as Food, Vol. III--Processing: Part 1, the address of the publisher was omitted. The publisher is Academic Press Inc., 111 Fifth Ave., New York, N. Y. 10003.



### THIS CHRISTMAS TREE IS SHRIMPPLY DELICIOUS

In answer to many requests, the United States Department of the Interior's Bureau of Commercial Fisheries has once again released instructions for its Shrimp Christmas Tree for the most exciting holiday table in the neighborhood.

From a commanding position on a buffet table or as a colorful centerpiece for a well-appointed holiday dinner, this unusual tree is certain to capture compliments. Leafy green endive duplicates crisp holly while ever-popular shrimp add shape and color interest to this creative conversation piece.

This intriguing tree is elegant but deceptively simple. The materials are readily available at most local variety stores and supermarkets.

#### SHRIMP CHRISTMAS TREE

3 pounds shrimp, fresh or frozen  
2 quarts water  
 $\frac{1}{2}$  cup salt  
4 large bunches curly endive

1 styrofoam cone,  $2\frac{1}{2}$  feet high  
1 styrofoam square,  $12 \times 12 \times 1$  inch  
1 small box round toothpicks  
Cocktail Sauce

Thaw frozen shrimp. Place shrimp in boiling salted water. Cover and simmer about 5 minutes or until shrimp are pink and tender. Drain. Peel shrimp, leaving the last section of the shell on. Remove sand veins and wash. Chill. Separate and wash endive. Chill.

Place cone in the center of the styrofoam square and draw a circle around the base of the cone. Cut out circle and insert cone. Cover base and cone with overlapping leaves of endive. Fasten endive to styrofoam with toothpick halves. Start at the outside edge of the base and work up. Cover fully with greens to resemble Christmas tree. Attach shrimp to tree with toothpicks. Provide Cocktail Sauce for dunking. Serves 12.



### FISHERY EXPERTS NEEDED FOR TECHNICAL ASSISTANCE IN MANY COUNTRIES

There are many technical assistance projects in nearly all of the developing countries of the world for which FAO is responsible. The following is a list of vacancies as of October 1, 1965, for which FAO is recruiting. Write (on a confidential basis if desired) to: Roy I. Jackson, Director, Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle terme di Caracalla, Rome, Italy.

The following list shows the country in which the vacancy exists, the types of fishery experts needed (in parentheses the duration of the assignment in months for the fiscal year 1965/66, with a possibility for extension):

Aden: Marine Biologist (24), Masterfisherman (32).

Argentina: Marine Biologist (60), Oceanographer (42), 2 Trawl & Purse Seine Technologists (60 & 36), Acoustics Technologist (24), Economist (54).

Brazil: Shrimp Biologist (12), Fishery Training Expert (24).

Central America: 2 Marine Biologists (48 & 33), Economist (48), Masterfisherman (47), 2 Fishing Gear & Methods Experts (47 & 48), 2 Fish Processing Technologists (30).

Ceylon: Masterfisherman (15), Fishing Gear Technologist (15).

Congo (Brazzaville): Marine Resources Survey Project Manager (36).

Cuba: Fishing Gear Technologist (9).

East Pakistan: Marine Biologist (60), Fish Processing Technologist (36), Marketing Economist (48), Statistician (36), Marine Engineering Technologist (12).

Ghana: Demersal Biologist (45), Gear Technologist (48), Masterfisherman (48), Fishery Training Expert (12).

India: Fish Processing Technologist (6), Reservoir Fishing Technologist (9), Fishing Harbor Survey Project Manager (36).

Iran: Inland Fisheries Biologist (6).

Jamaica: Masterfisherman (15).

Lake Kainji: Economic Development Project Manager (60).

Lake Kariba: Gear Technologist (42).

Lake Nasser: Economic Development Project Manager (60).

Lake Victoria: Statistician (24), Masterfisherman (36), Cost Economist (24).

Malaysia: Fishery Development Adviser (12).

Mexico: Fishery Development Adviser (12), Marketing Economist (12), Masterfisherman (18).

Nigeria: Masterfisherman (15), Marine Biologist (35).

Peru: Marine Resources Survey Project Manager (48).

Philippines: Fish Processing Technologist (24), 2 Marketing Economists (48), Naval Architect Technologist (30).

Senegal: Fishing Gear Technologist (9).

Sierra Leone: Marine Resources Survey Project Manager (60).



## RAINBOW TROUT FINGERLINGS PLANTED IN WESTERN LAKE BY AIRPLANE

The rainbow trout population of Lake Powell in Arizona and Utah was increased by 4 million fish in May 1965 from hatcheries of the Bureau of Sport Fisheries and Wildlife, U.S. Department of the Interior. The rainbow trout fingerlings were air-dropped 200,000 at a time in one of the largest aerial stockings of fish ever undertaken.



Fig. 1 - Airplane planting of young fish in Lake Powell.

The hatcheries are at Willow Beach, Alchesay, and Williams Creek, Ariz., and at Saratoga, Wyo.

Similar aerial fish stockings in 1963 and 1964 planted 7.6 million trout and 3 million black bass in the lake with only minor losses from impact on the lake surface.

Glen Canyon Dam, on the Colorado River at the Arizona-Utah border, was constructed by Interior's Bureau of Reclamation. The dam is 710 feet high and has a 1,550-foot-long crest. Its reservoir, Lake Powell, eventually will extend 186 miles upstream and will have a surface of 162,700 acres, with a shoreline that will extend almost 1,900 miles.

When the new stocking program is completed, a total of nearly 15 million fish from Federal fish hatcheries will have been planted in Lake Powell. That lake already ranks as one of the best fishing spots in the West.

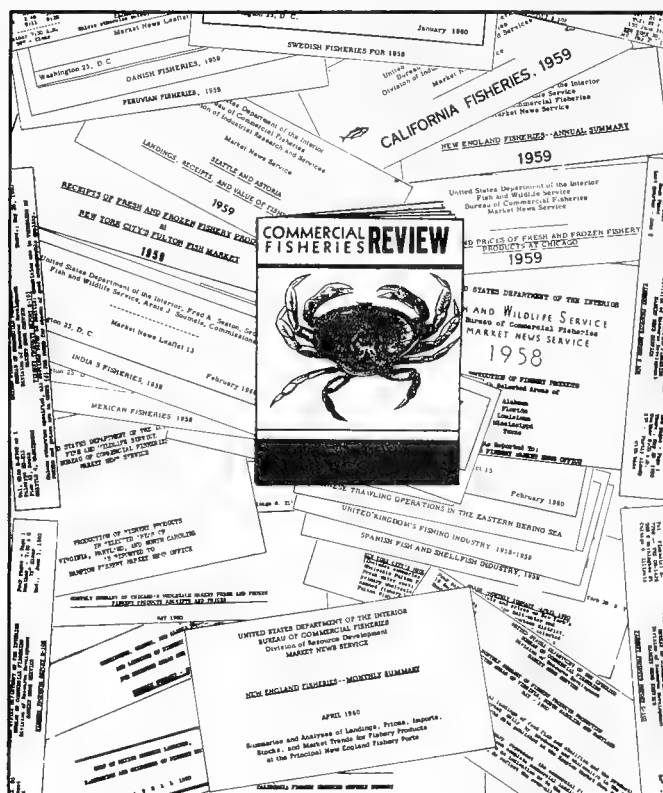


Fig. 2 - Another view of airplane dropping fingerlings in Lake Powell.

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A PHOTOMONTAGE OF MANY OF THE REPORTS CURRENTLY RELEASED  
BY THE BRANCH OF MARKET NEWS, BUREAU OF COMMERCIAL FISHERIES







## HIGHLIGHTS IN THIS ISSUE (DECEMBER 1965)



### Features

**A JAPANESE GILL-NET FISHERY FOR BOTTOMFISH IN THE GULF OF ALASKA--**  
Exploring areas where trawling is normally not permitted (p. 1).

**REDUCTION PROCESS TO CONVERT RAW FISH INTO THIAMINASE-FREE PRESS CAKE--**Increases the use of rough fish in small fishing operations (p. 13).

### Trends in the United States Fisheries

**FISHERY TECHNOLOGY DEVELOPMENTS--**A rapid field method for determining the salt concentration in fresh and smoked chub (p. 18).

**TRANSPORTATION AND MARKETING AID--**New plastic fish boxes to aid fresh fish marketing (p. 21); airline cuts rates 40 percent on northwest fishery shipments to eastern points (p. 44).

**CENTRAL PACIFIC--**Oxygen studies in relation to catching tuna (p. 28); submarine for underwater research brings new discoveries (p. 29).

**BLUE CRAB--**Cleaner-debacker machine to be tested under commercial conditions (p. 27).

**GREAT LAKES--**Michigan plans to introduce striped bass in southern waters (p. 32).

**OCEANOGRAPHY--**Coast guard cutter Northwind completes major study in Siberian Arctic (p. 42); Sea Lab II report will be featured at symposium in Washington, D. C. (p. 43); study of unmanned buoys off Massachusetts (p. 44).

### Reports on Foreign Fisheries

**FOOD AND AGRICULTURE ORGANIZATION--**Designing with computers discussed at third international technical meeting on fishing vessels (p. 47).

**NORTH SEA--**Special fishery charts published (p. 48).

**ECUADOR--**Export opportunity for fishing vessels and processing equipment (p. 54).

**ICELAND--**Landings, foreign trade, and fisheries trends (pp. 56-59).

**REPUBLIC OF KOREA--**Large-scale expansion of fishing industry planned (p. 72).

**JAPAN--**Trends in major fisheries--tuna, crab, salmon, shrimp, swordfish, saury, and pollock (pp. 60-70); new portable tuna catcher vessels (p. 71); improved method for setting and retrieving long-line gear developed (p. 72).

**NORTH VIET-NAM--**Fishing fleet expands with Soviet aid (p. 75).

**MEXICO--**United Nations special fund projects to aid fisheries development (p. 74).

**PANAMA--**Fisheries development outlook (p. 77).

**U.S.S.R.--**Use seaweed for animal feed (p. 82).

**UNITED KINGDOM--**Lobster hatching experiments in Guernsey (p. 82).

ALSO FISHERY NEWS FROM 16 OTHER COUNTRIES.

### Plus

Fisheries in Alaska, California, American Samoa, Great Lakes, Louisiana, and Washington; industrial products; State and Federal actions affecting fisheries; reviews of recent fishery publications throughout the world.

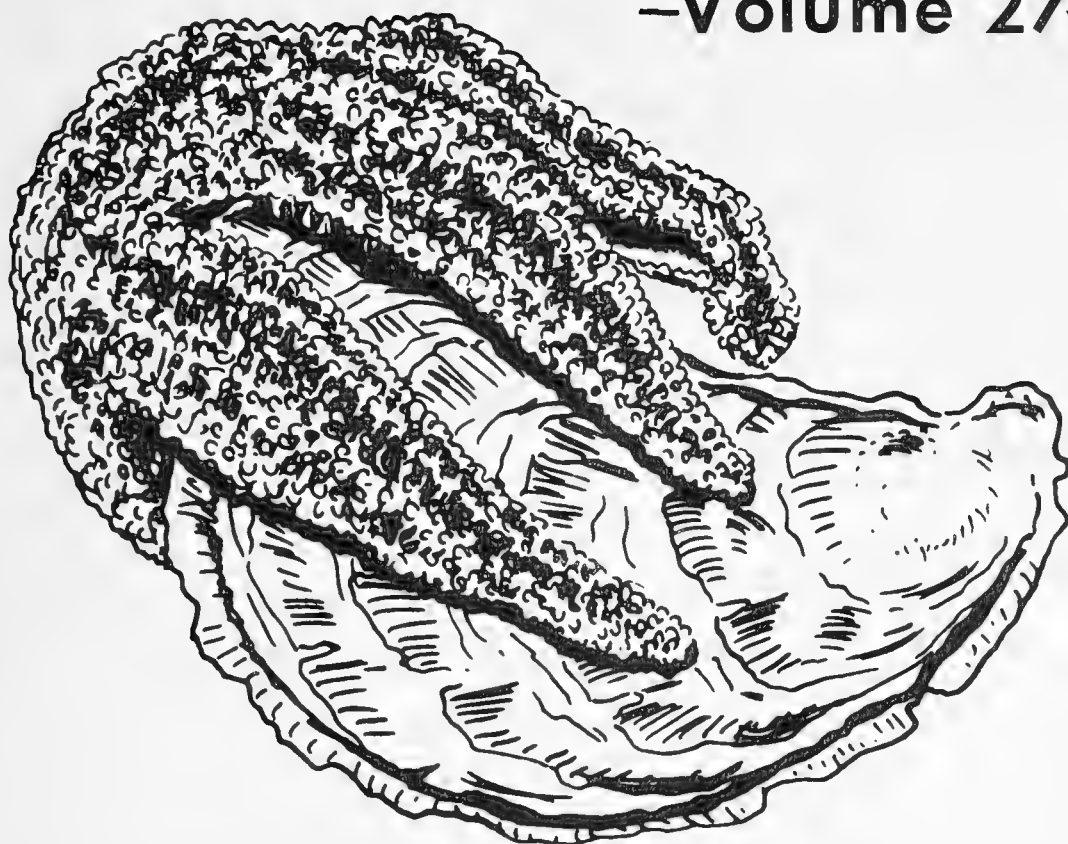
ROBERT H GIBBS JR

# COMMERCIAL FISHERIES REVIEW

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Fishes

## INDEX for 1965

—Volume 27—



**UNITED STATES DEPARTMENT OF THE INTERIOR**  
*Fish and Wildlife Service*  
**Bureau of Commercial Fisheries**  
*Washington, D.C.*





# COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries  
prepared in the BUREAU OF COMMERCIAL FISHERIES.

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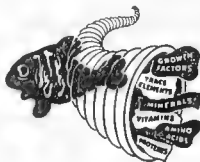
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An index of Volume 27, Numbers 1 through 12, issued in 1965. It is a subject index, with an author index for only the feature articles in each monthly issue. Indexing of other material is based on the principal subject with some cross-reference. The use of "\_\_\_\_\_" in entries denotes the omission (repetition) of the major subject heading which appears in ALL CAPS.

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